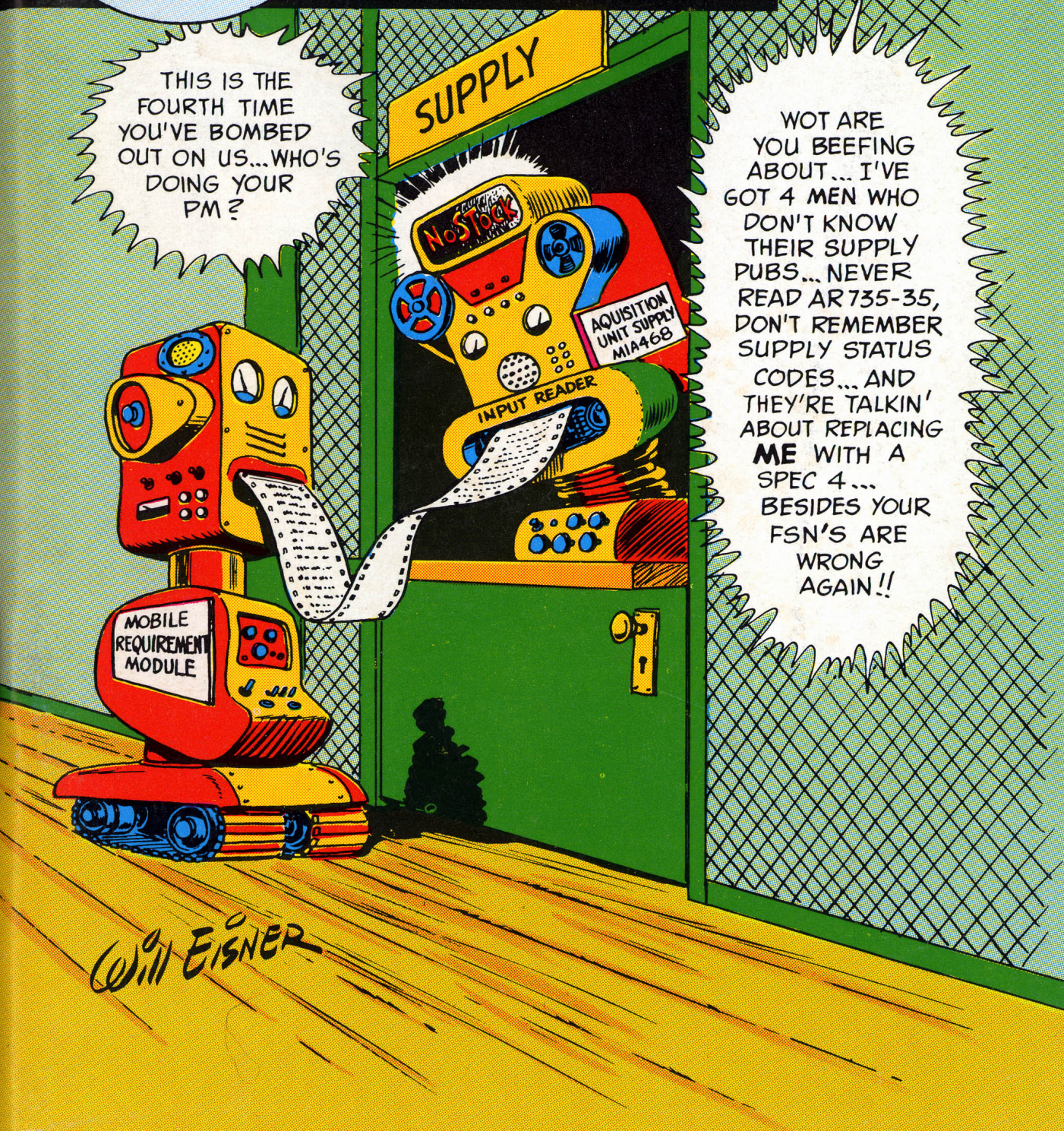
Issue 199

PS

1969 Series

THE PREVENTIVE MAINTENANCE MONTHLY



IS YOUR TESTER
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DUSTY?

A lot of guys who do maintenance on engine-driven equipment shy around the electrical system like it was a ghost ready to gobble 'em up.

What's more, when something goes wrong in the electrical system these guys throw out generators, regulators and batteries like mad. Test 'em out with your LVCT? Nevah hoppen!

The guy who's a pro knows it's easy to check out your electrical system's parts. All you need is a little time, patience and know-how.

You can do it with the Generator and Voltage Regulator Test Set (FSN 4910-092-9136) which your outfit has in its Common Tool Kit.

The words and pictures on how to use the tester are in either –

TM 9-4910-401-12 & Ch 1
(For Auto Test Inc Model 10308 and Atomic Engineering Model TV 100)

or

TM 9-4910-402-12 & Ch 2
(For Electro Mechanisms Corp Model 1060)

So, make like a pro and get your tester off the shelf where it's been collecting dust. Use the manual to learn how to check out your electrical parts. The pro makes sure before he tosses out a part. Try it. You might be amazed how easy it is.

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Sgt. Half-Mast,
PS Magazine,
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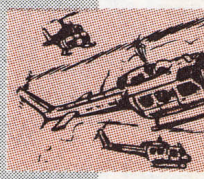

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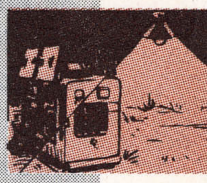

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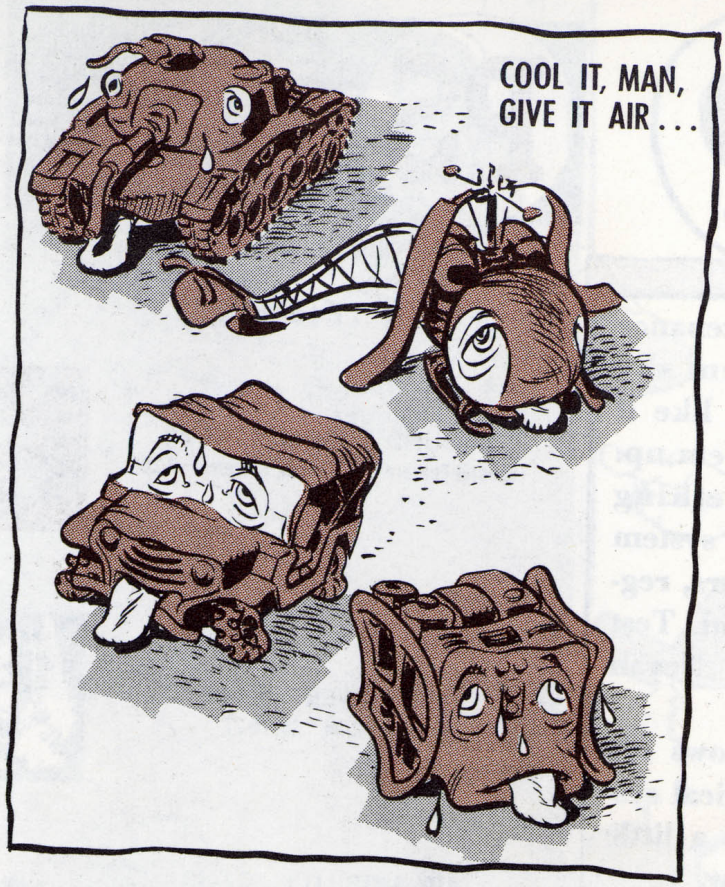
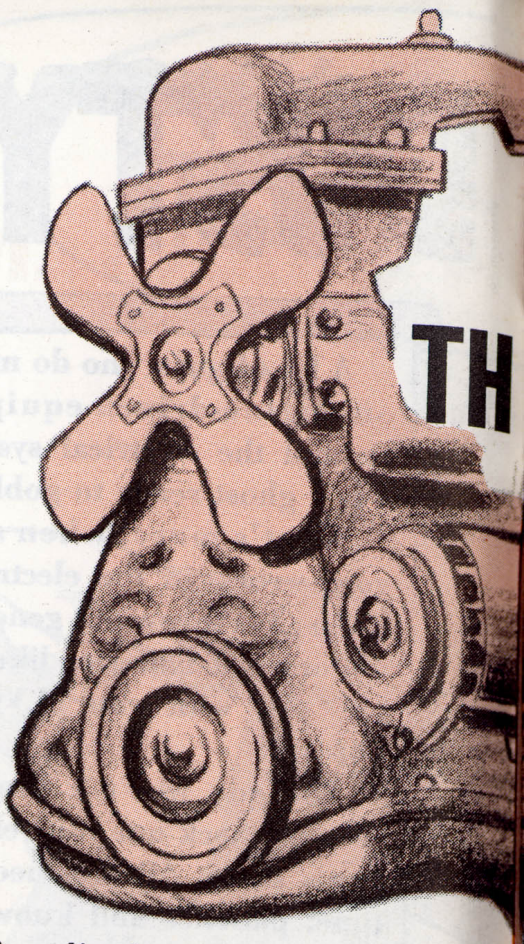




It's much, much hotter than you think . . . gasoline, diesel, multifuel or jet fuels — air or liquid-cooled . . .

Whatever you push, its cooling system has got to be in good shape or you're not going anywhere.

That's no threat. That's a fact.

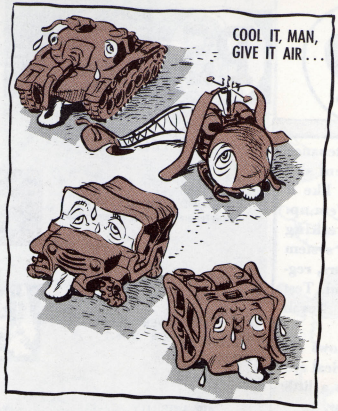
On sedans, trucks, tanks, SP's, APC's, tractors, aircraft, cranes, MHE, compressors, generators — on anything, in fact, that's powered by an internal combustion engine — the heat created in the combustion chamber by the burning fuel is downright hotter'n blazes.

For example, on some vehicles — inside where the horses live — heat may go as high as 4500°F. Some iron, my friend, melts at around 2000°F. Or, as the heat experts tell it — the excess heat generated by a hardworking, high output engine could melt a 200-pound engine block in 20 minutes.

Diesels run a mite cooler than other types, but they still put out plenty heat.

And, of all that fantastic heat only about 1/3 is used for power. Another 1/3 is handled by the exhaust system. Getting rid of the rest, as fast as possible, is the big job of your engine's cooling system.

Which is why you've got to know your engine's safe operating temperatures, and you've got to mind your cooling P's and Q's. 'Cause, if ever the cooling system fails and you don't catch on fast, the engine can quickly end up a lump of junk.



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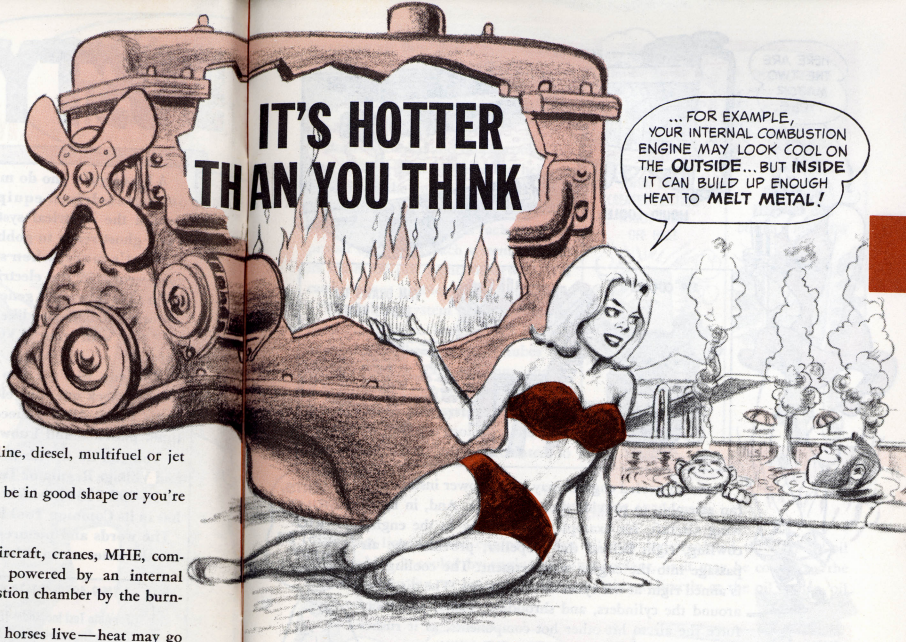

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COOLING SYSTEM CHORES

In addition to getting rid of excess heat and maintaining safe engine operating temps under all conditions, your cooling system protects the engine against overcooling, which can also stop you fast. And, it usually provides cooling or warming services, as needed, for other components, accessories or systems on the equipment (differential and/or transmission oil coolers, heaters, compressors, auxiliary engines, etc.).

Your equipment is cooled by either a liquid cooling system or an air cooling system. One cools with a liquid, which in turn is cooled in a radiator by a fan and outside air. The other uses a cooling fan and shrouding to force air over, across and around the engine and other hot spots in the engine compartment.

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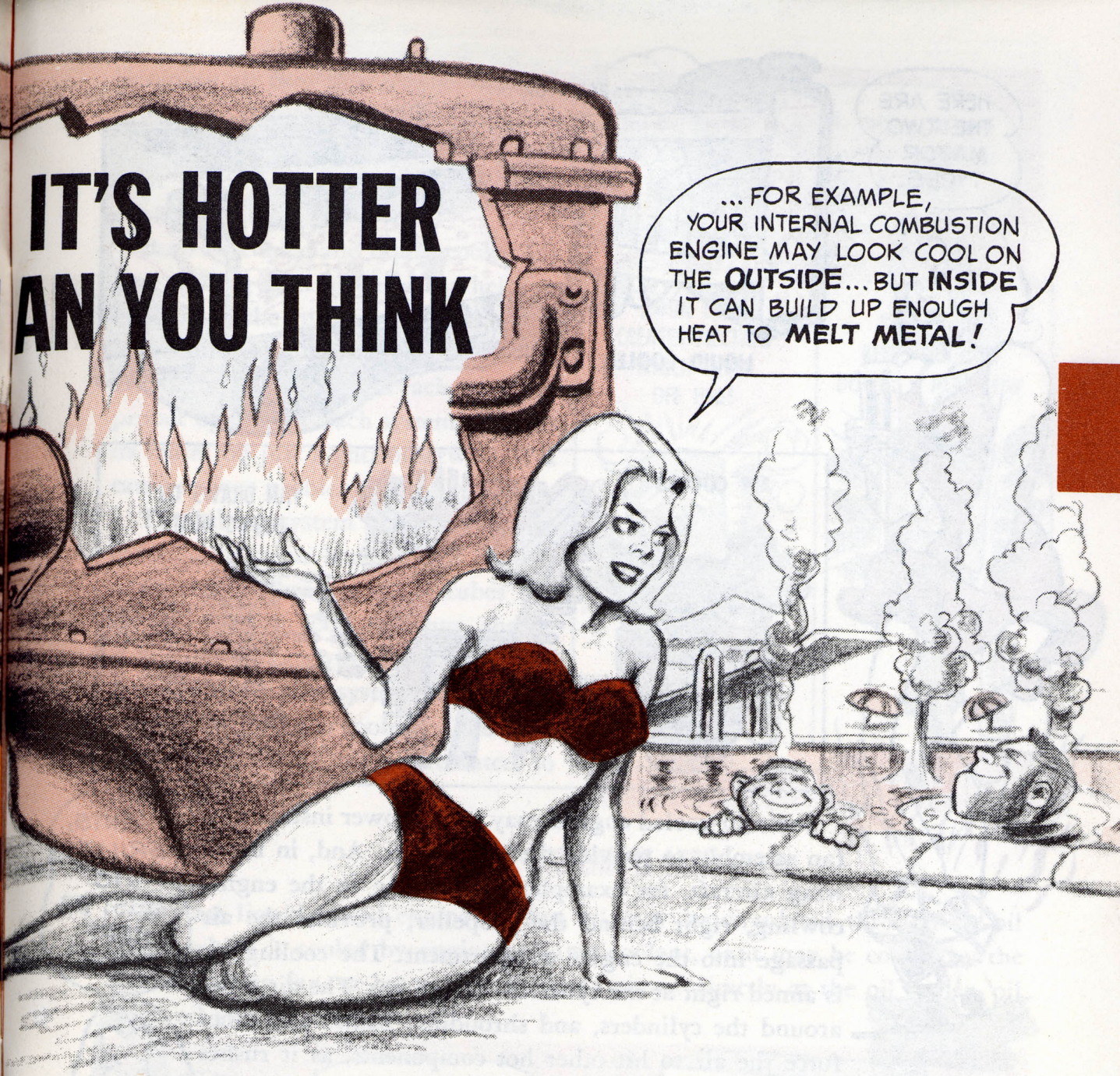

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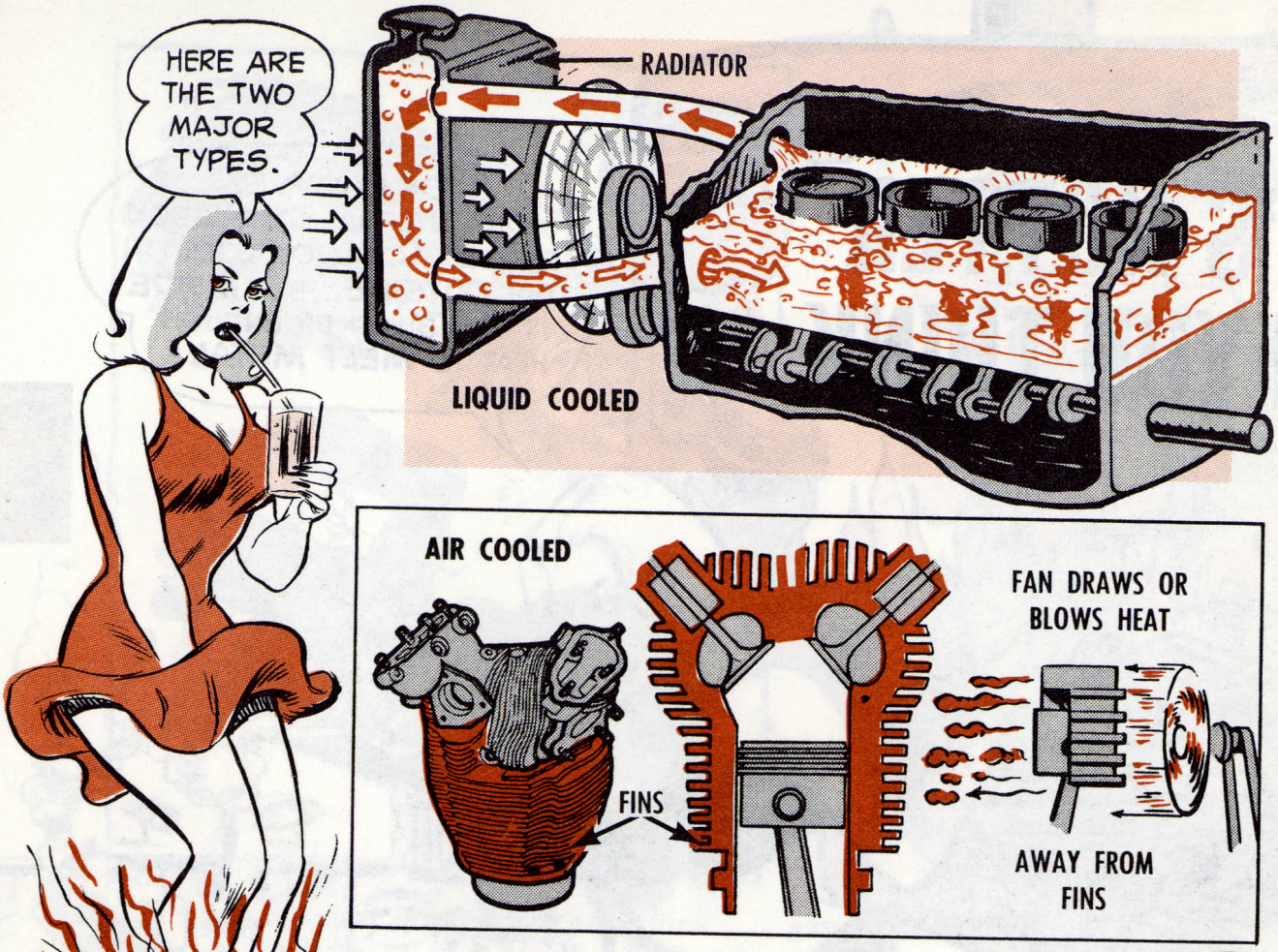
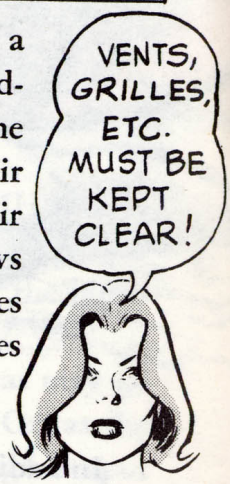
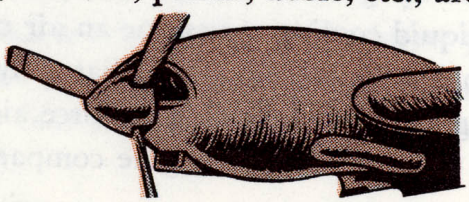


Some air-cooled engines may use a blower instead of a fan assembly to provide the cooling air. And, in fixed-wing aircraft, for example, the opening in the engine cowling, right behind the propeller, provides the air passage into the engine compartment. The cooling air is aimed right at the cylinder cooling fins. The air flows around the cylinders, and shrouding, baffles and tubes force the air to hit other hot components, as it rushes out of the engine compartment.



COOLING HELP

All the special design features, such as heavily finned cylinder heads and barrels (in air-cooled engines), shrouds, air baffles, ducts, vents, deflectors, grilles, shutters, panels, doors, etc., are also important factors in engine cooling. They're used to direct the cool air to exactly the right places, and to pass the hot air out of the engine compartment fast.



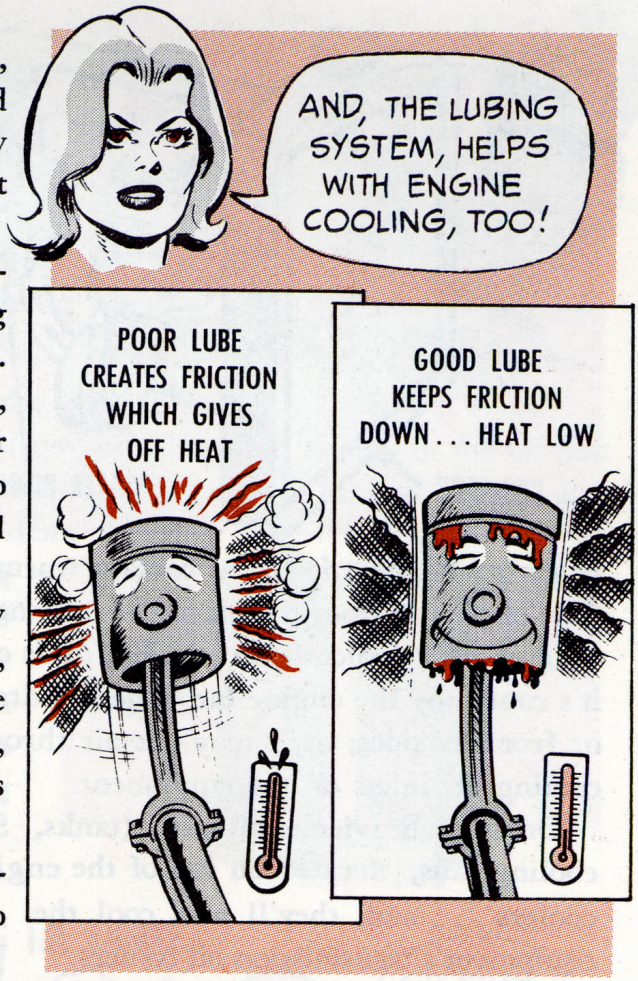
With either cooling system, a running engine must be constantly hit by streams of cool, outside air. And, natch, it's up to you to make sure that the

incoming air flow doesn't get blocked, detoured or slowed up in any way, and that the used air can stream away freely so it won't be recirculated to the hot engine.

Both air-cooled and liquid-cooled engine cooling systems get a big helping hand from the engine's lubing system. The cooling and lubing systems, in fact, are mighty dependent on each other for proper operation. Each system must do its main job just right; otherwise, it'll cause serious problems in the other.

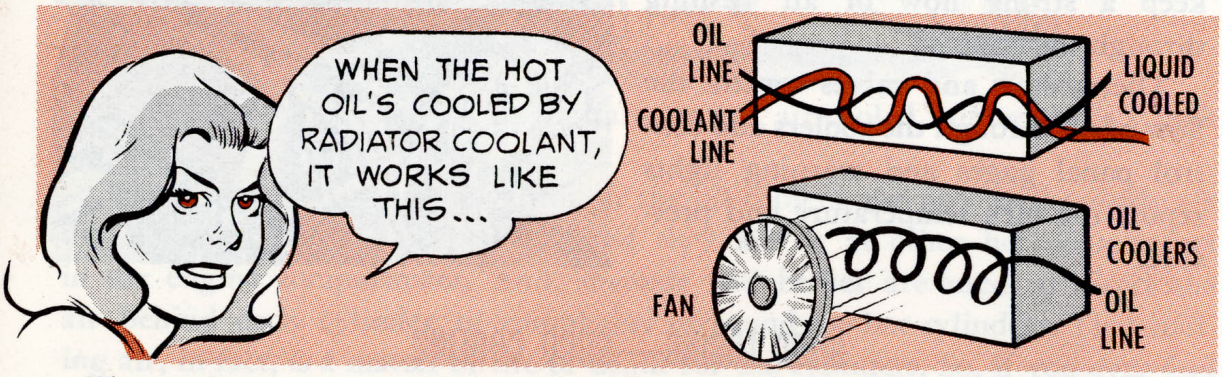
The lubing system helps cooling by reducing friction heat in the engine, and carrying heat off as it lubes the engine. And, it cools bearings, shafts, rods, and other moving parts as it flows through the lubing system.

The oil in turn is cooled by the cooling system before it's recirculated to the engine.



COOLING THE ENGINE LUBE

In your liquid-cooled engine the hot oil may be circulated through an oil cooler which is cooled by engine radiator coolant, or it may be cooled by the engine cooling fan, or by outside air that's aimed directly at the oil cooler, oil lines, oil pan or reservoir.



The equipment's transmission oil cooler may also be piped for coolant cooling, or it may be cooled by the fan.

The oil and the coolant have separate passages through the oil cooler. The passages are designed to transfer heat easily from one liquid to the other. During

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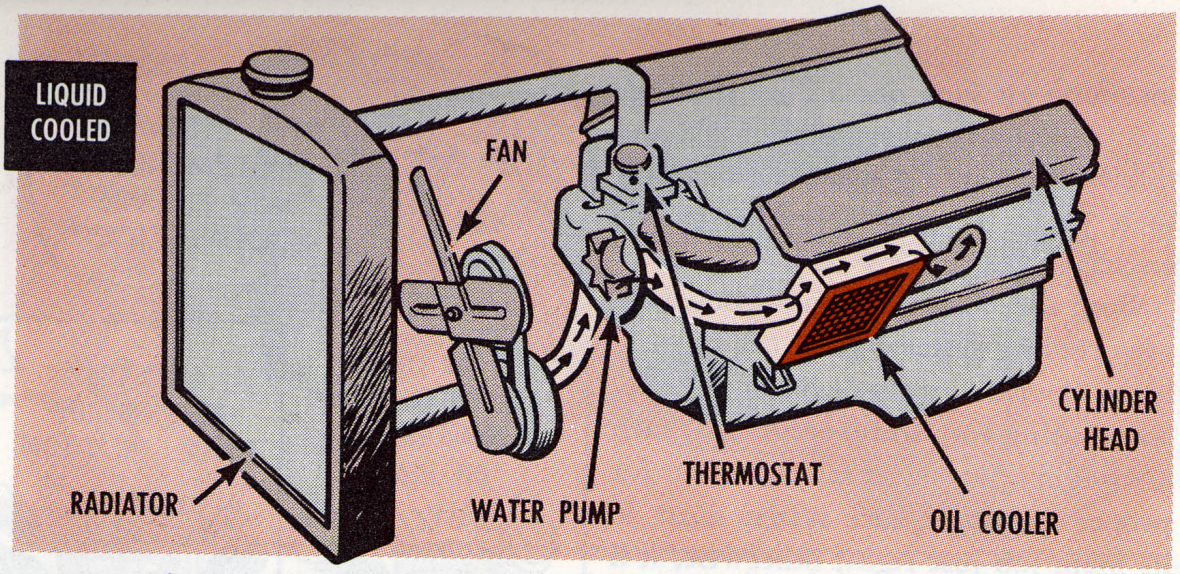


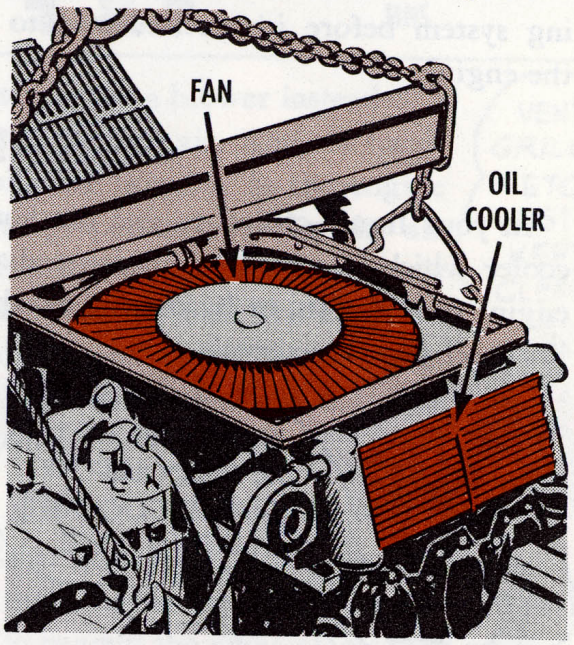
warm-up the heat from the coolant warms up the oil, and during operation the flow of heat is from the oil to the coolant.

In engines cooled by air the hot oil is circulated through an oil cooler, where it's cooled by the engine fan. The fan draws outside air from under the engine or from its sides; or it may get air through grilles, screens, shutters or other cooling air inlets on the equipment.

On some heavier equipment (tanks, SP's, recovery vehicles, etc.) 2 engine cooling fans, located on top of the engine, will handle 2 or more engine oil coolers . . . and, they'll also cool the equipment's transmission oil coolers.

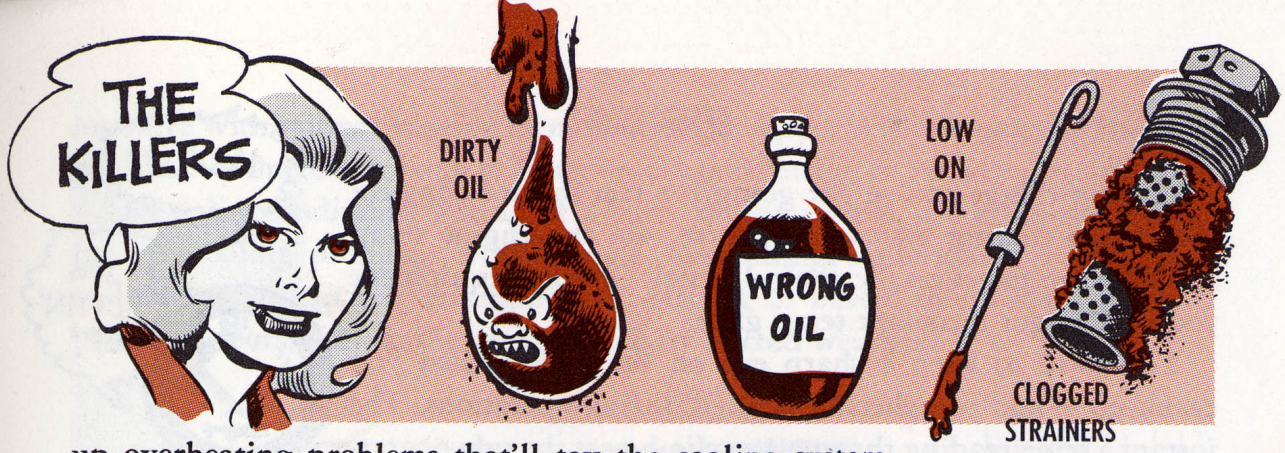
The equipment uses radiator-type oil coolers which are mounted along the top sides of the engine, and handy as possible to the overhead fans. The hot oil circulates through oil lines in the finned core of the coolers, and the fans keep a strong flow of air rushing through the coolers.

Thermostats and valves control the flow of oil through the coolers and control panel gages and warning lights report the oil's temperature and pressure.



GOOD LUBING—GOOD COOLING

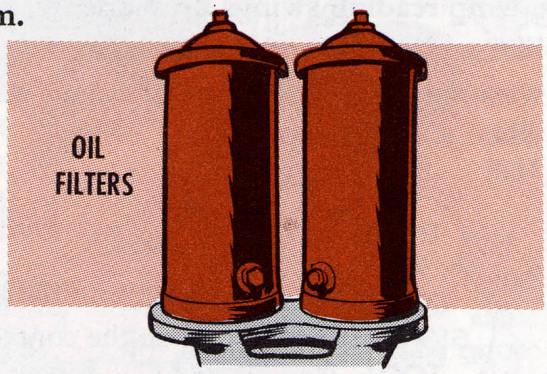
To help with cooling, of course, a lubing system must be clean and in good order. And, it must have the right amount of good, clean oil. Contaminated oil, the wrong oil and low oil levels are first-class trouble makers. While they're causing wear and damage in the engine and the lubing system, they'll also kick

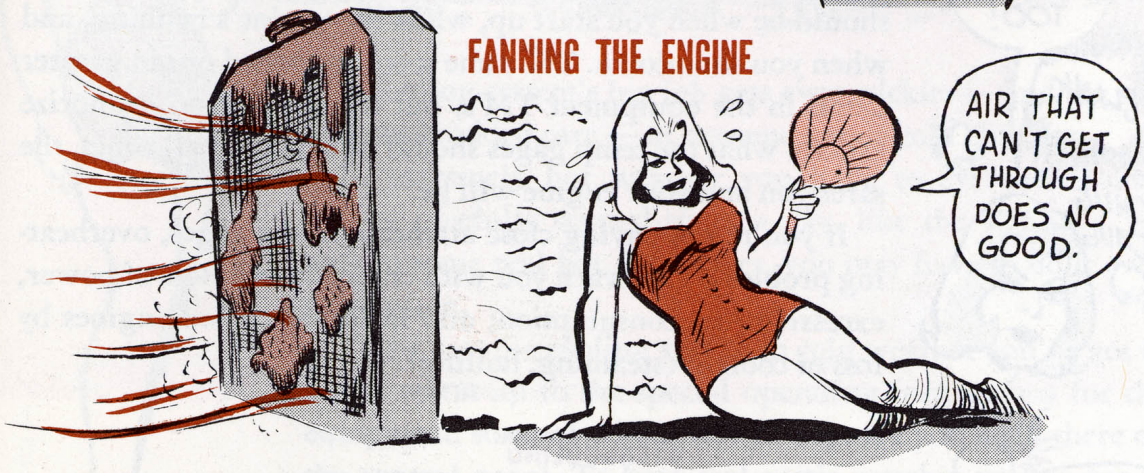


up overheating problems that'll tax the cooling system.

And, clogged, dirty oil coolers, oil lines, oil filters and sludge in the oil pan or reservoir not only interfere with oil circulation and lubing, they'll also insulate the oil against the cooling system.

On the other hand, if the cooling system fails, the oil's lubing powers can be quickly fouled up by the excessive heat that'll build up in the engine. Then varnish and other harmful deposits will form in the engine and the lubing system.





While you're this close up to the fans on an air-cooled engine, here's how they cool the hot spots on the engine:

In addition to drawing air through the oil coolers, the fans pull outside air through the cylinder cooling fins and they aim it at other hot components in the engine compartment. And, shrouds and baffles are used to direct the air behind each cylinder to completely surround the hot cylinders. That cooling air, in fact, is a matter of life or death for the cylinders. So, if you ever find shrouding or baffles missing, cracked, bent, installed wrong or in anyway out of line, you'd best forget about operating the engine until the problem gets fixed. Same goes when cylinder cooling fins or oil cooler cores are damaged in any way.

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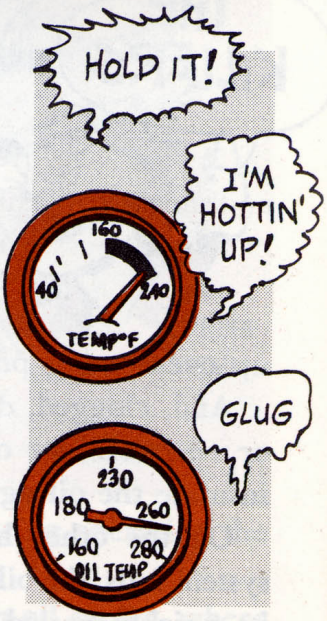
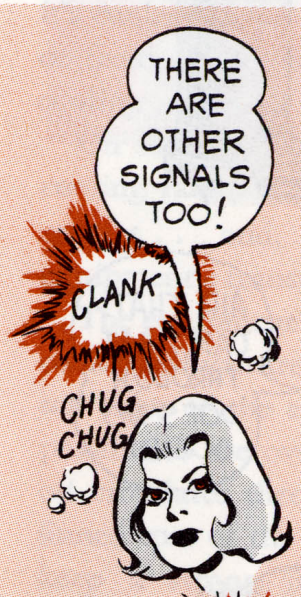
TEMP GAGES



The big things you've got going for you in bird-dogging the engine cooling system, of course, are the engine temp and oil temp gages on the control panel. On some equipment you've also got a coolant temp gage.

You have to keep a sharp eye on the gages when you crank-up—and you check 'em often during operations. The instant a gage reading threatens to climb past the safe operating zone, you have to stop fast, cool the equipment and troubleshoot for cooling problems. Also, during warm-up, if a temp reading swings up suddenly, you have to stop quick-like and check out the problem. Same goes if a gage or a warning light refuses to give you a safe reading or signal when you start up.



HANDY DATA

Along with the gages, most equipment uses data plates and decals on the control panel to tell you what the gage readings should be when you start up, when the engine's running, and when you shut down. The same scoop is spelled out in greater detail in the equipment TM's, but the sooner you memorize exactly what the temp gages should be saying at all times, the safer you and your engine will be.

If you're not paying close attention to the gages, overheating problems also warn you with engine knock, loss of power, excessive fuel consumption; and in liquid cooled engines by loss of coolant (steaming, boiling).

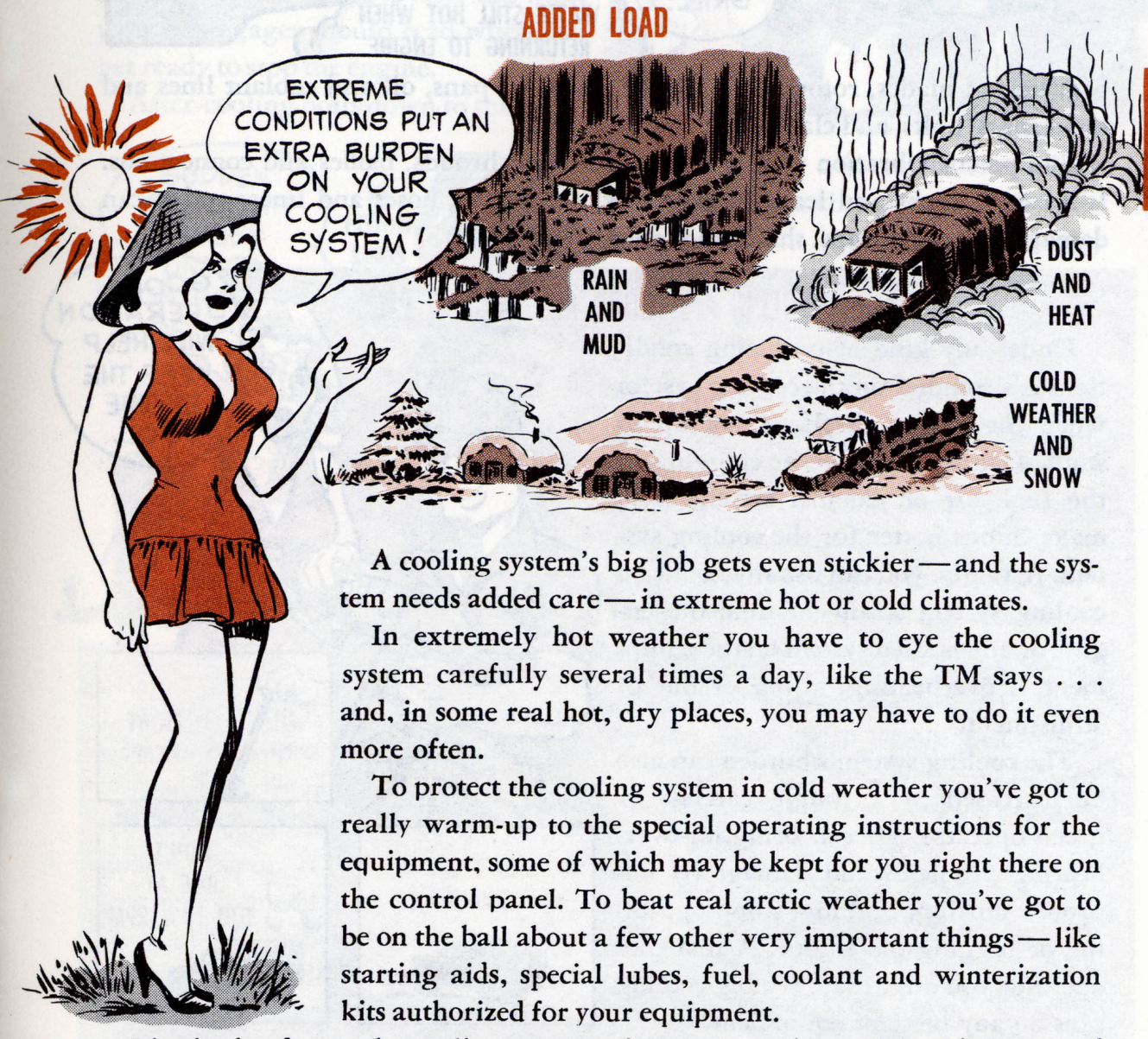
OVERCOOLING

With most equipment, to guard against overcooling problems and damage, you have to keep the warm-up run as short as possible. You also stop fast if the gage readings don't start moving up to safe operating temps like they should.

Although overcooling may not be sudden death for the engine, like overheating is, it can cause serious headaches. For one, the engine'll run rough, lose power and waste fuel. In a cold-running engine, fuel exhaust and water vapors can blow-by the piston rings and into the oil system where they'll form acids that'll corrode the engine. Lower operating temps also

interfere with normal venting of moisture and vapors in the oil system. That too, can mess up the lube enough to bring on engine damage or increased wear.

Operating conditions, instead of a bum cooling system, are often responsible for overcooling problems. For example, long idling, underloading, low speeds and short hauls can keep an engine cold. Missing or busted thermostats, shutters, panels or doors, will do the same, especially in cold weather.



A cooling system's big job gets even stickier — and the system needs added care — in extreme hot or cold climates.

In extremely hot weather you have to eye the cooling system carefully several times a day, like the TM says . . . and, in some real hot, dry places, you may have to do it even more often.

To protect the cooling system in cold weather you've got to really warm-up to the special operating instructions for the equipment, some of which may be kept for you right there on the control panel. To beat real arctic weather you've got to be on the ball about a few other very important things — like starting aids, special lubes, fuel, coolant and winterization kits authorized for your equipment.

It's also harder on the cooling system when your equipment must be operated at a very high or very low speeds for a long time, or when a vehicle makes long uphill hauls, rolls cross-country, or in muddy, sandy areas.

For example:

Flying debris, mud, dirt, leaves, branches, bushes, bugs, rocks, gravel, and sand clog and damage radiators, oil coolers, fan shrouds, fan wells, air passages, screens, shutters and air outlets. They'll dent, crack, loosen, wear or otherwise

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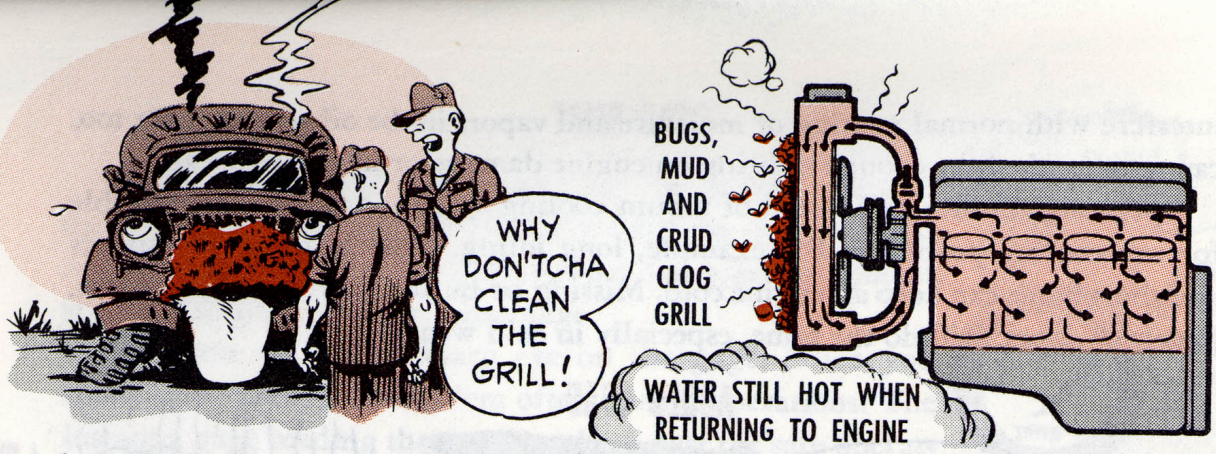


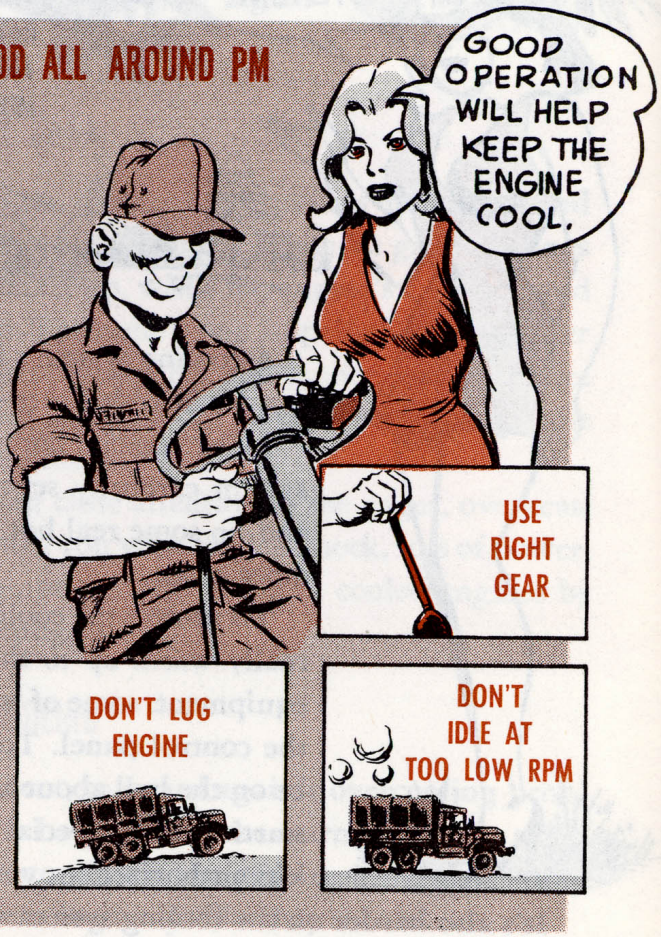
beat up fan blades, rotors, belts, drain cocks, oil pans, oil and coolant lines and hoses, nuts, bolts, and clamps.

Equipment vibration will loosen mountings, shrouds, baffles and connections. It'll cause cracks and leaks in radiators, oil coolers, hoses and lines, and it can damage pulleys, pumps, shafts and tanks.

COOLING AID: GOOD ALL AROUND PM

Under any kind of operating conditions it's rougher on the cooling system when the engine, itself, is not up to snuff. Damage, leakage or clogging in the fuel, air or exhaust systems also make things hotter for the cooling system. Actually, you can usually count on cooling system strain anytime the engine or any related system on the equipment is overheating, ailing or out of adjustment.

The cooling system's burden can also be increased by a rough, careless or green operator. He can bring on overheating problems and damage by improper shifting, braking, stopping, idling or lugging the engine. A real cool operator you might say, is a big cooling plus on any piece of equipment.



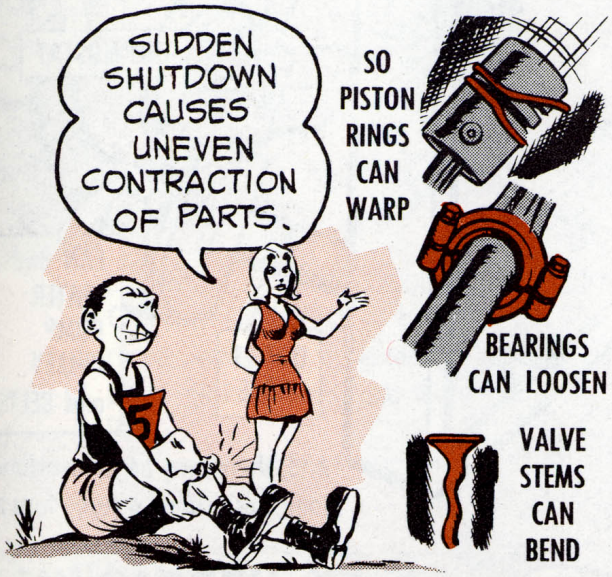
SHUT-DOWN COOLING

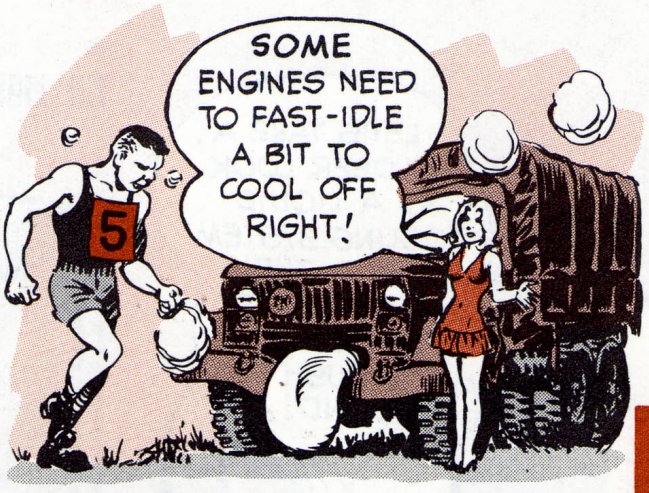
Overheating damage is a big threat even when you stop after a hot run. Proper shut-down SOP is important PM for all equipment, but it's especially critical for some vehicles.

Briefly, you have to cool some engines slow-like by idling 'em fast for a few minutes before you stop 'em. Two to 5 minutes (or a few more) of fast idling

is usually enough. But after-cooling needs vary for different kinds of equipment, and the length of time the engine has been running may also make a difference. So, be sure you know exactly what your specific equipment needs . . . how fast and how long to idle, and what your temp gages should read when you get ready to stop the engine.

After-cooling boils down to this —





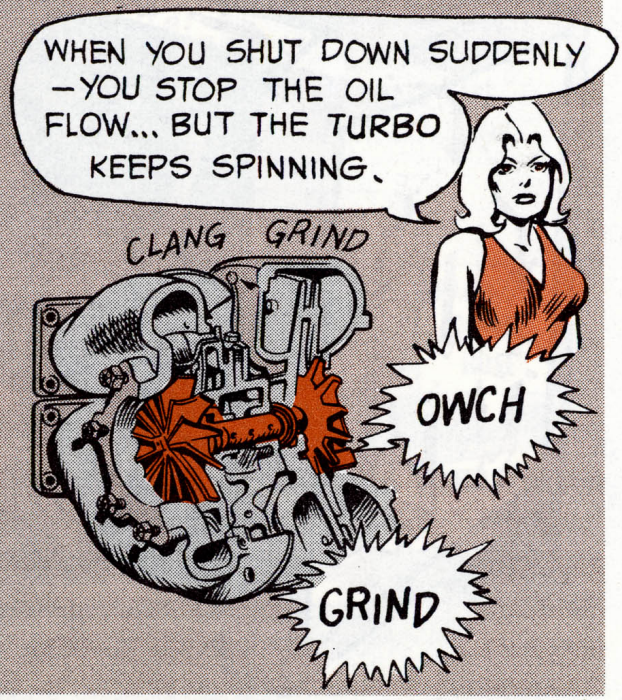
In those few minutes of fast idling the engine has a chance to cool off more evenly. If you shut down suddenly, without after-cooling, the trapped heat —which is greater in some parts of the engine than it is in others—will cause uneven contraction of metal as the engine starts cooling. The uneven contraction can crack or warp the engine block, cylinder heads, damage pistons, piston rings, bearings, and valves, and foul up fuel injectors, the exhaust manifold, seals, gaskets and thermostats.

EASY ON THE TURBOCHARGER

After-cooling is doubly important on vehicles equipped with turbochargers.

A turbocharger is free-spinning and the unit gets all its oil from the engine lubing system. It'll continue whirling like mad (some 30,000-50,000 RPM's), without lube, when the engine is stopped suddenly. Idling the engine for a few minutes keeps the fans working and the oil flowing, so the turbo can cool some and the spinning can slow up a bit.

Without after-cooling the fantastic heat from the dry spinning can damage the turbo's seal, freeze the bearing to the turbine shaft and warp the rotor blades.



PS MORE

THE LIQUID COOLER

LET'S TAKE A CLOSER LOOK AT A LIQUID COOLING SYSTEM ...IT'S THE KIND YOU'RE MOST LIKELY TO PUSH AROUND.

a COOLANT RADIATOR with a pressure cap and an overflow pipe

INLET HOSE

WATER PUMP

FAN

THERMOSTAT

FAN and WATER PUMP PULLEY and BELTS

OUTLET HOSE

And, there may be an overflow tank (also called a surge tank).

HERE'S HOW IT WORKS

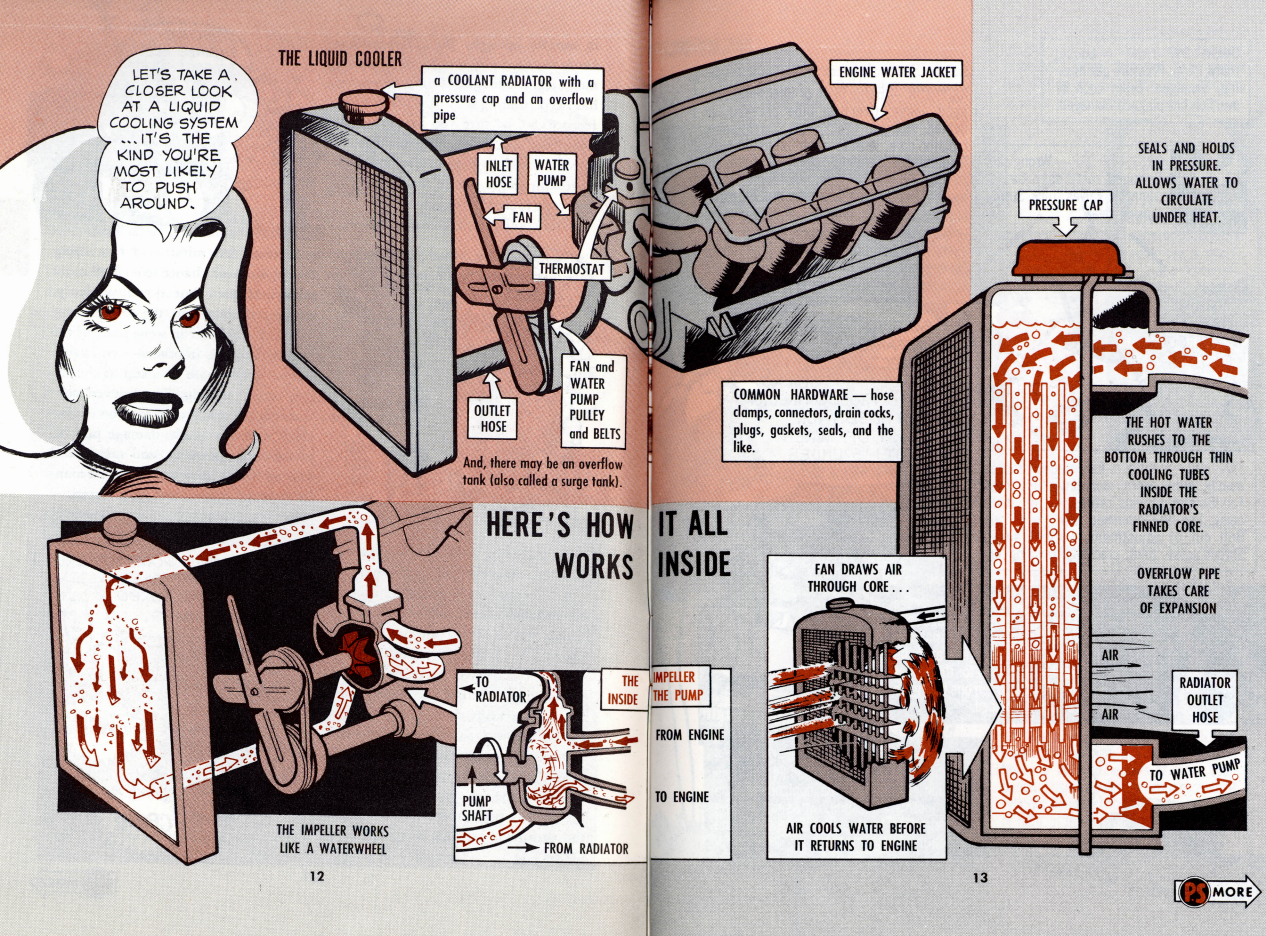
THE IMPELLER WORKS LIKE A WATERWHEEL

TO RADIATOR

THE INSIDE

PUMP SHAFT

FROM RADIATOR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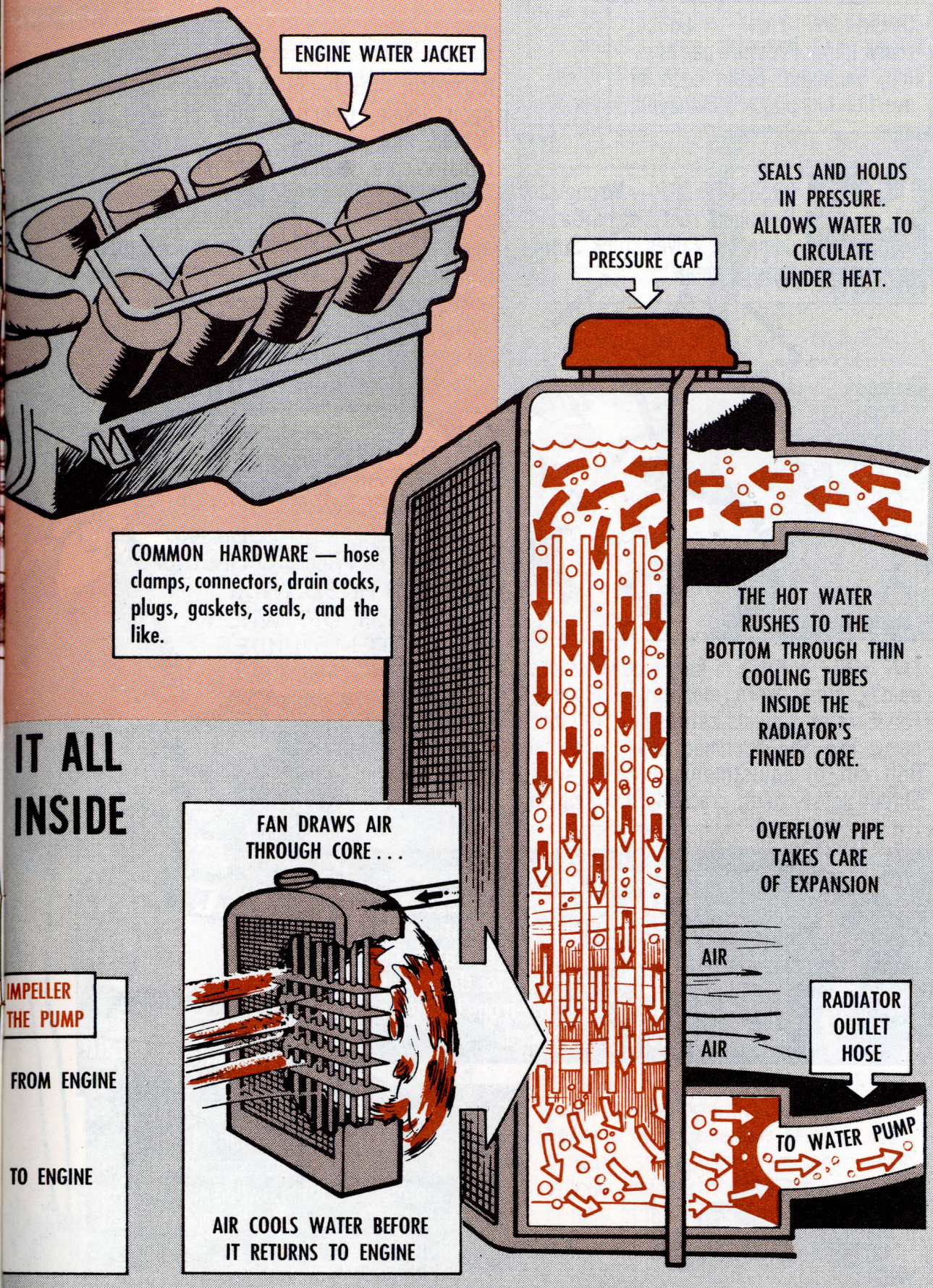
AIR COOLS WATER BEFORE IT RETURNS TO ENGINE

PS MORE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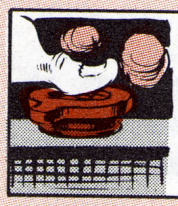
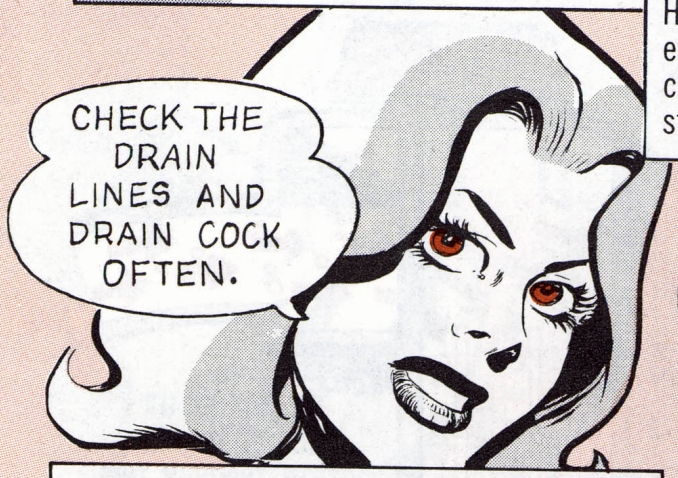
P.S MORE

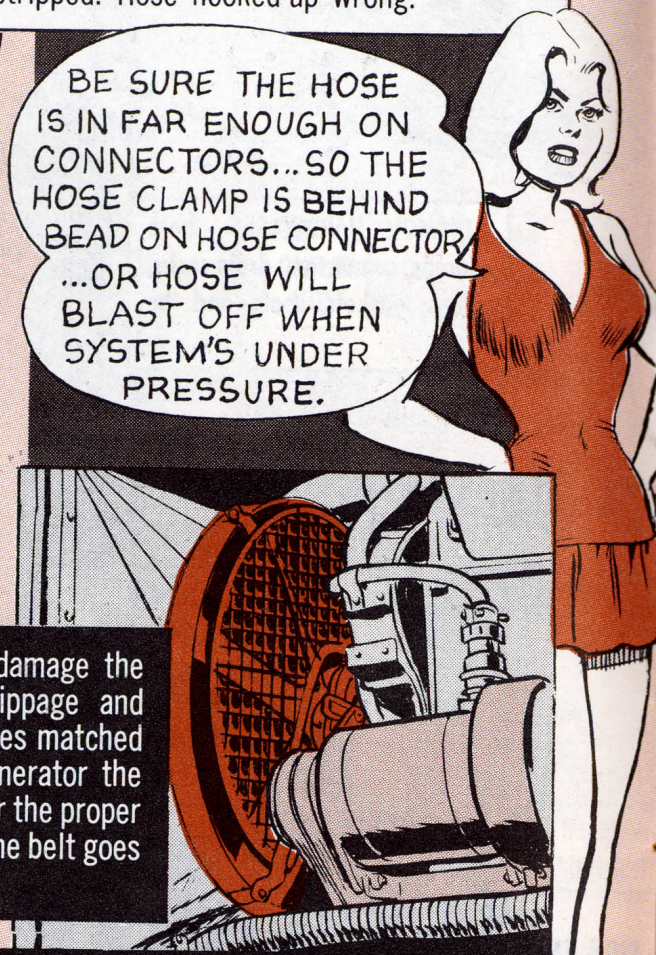
OVERFLOW TANK — Loose, rusty, leaky. Pressure cap missing, damaged. Drain cock or overflow line plugged, damaged.



PRESSURE CAP — Wrong cap. Damaged, rusty, dirty. Gasket damaged. Valves stuck. Spring tension weak.

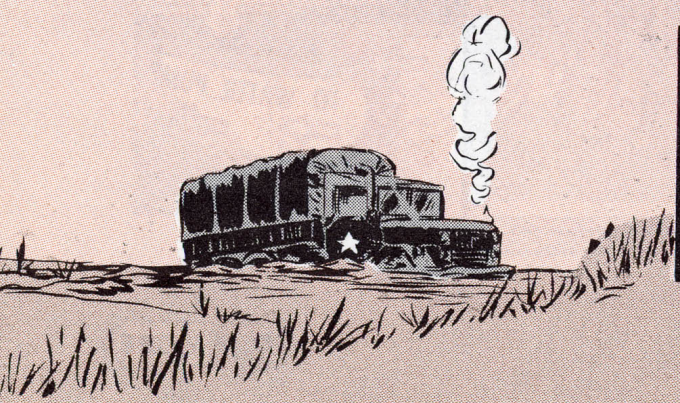
RADIATOR — Baffle plate or filler neck damaged, loose. Overflow pipe cracked, or dented, clogged. Leaks, rust, corrosion in radiator core, seams, upper or lower tank. Radiator core clogged, blocked; fins bent, crushed. Radiator mountings loose, damaged. Cooling tubes clogged with rust, grease, corrosion, shreds of rubber hose Hoses leaky, cracked, worn, rotted, hardened, collapsed, swollen, sucking air. Hose clamps loose, buckled. Clamp-bolt threads stripped. Hose hooked-up wrong.





FAN AND SHROUD — Fan blades cracked, muddy, grimy, worn; mounting studs loose. Fan vibrates, squeals, rattles or is otherwise noisy. Fan well crammed with trash, mud. Belt out of adjustment, worn, cracked. Shroud loose, bent, cracked, crowding fan.

Improperly adjusted belts can damage the pump and generator, cause slippage and overheating. When equipment uses matched belts on fan, water pump or generator the belts must be replaced as a set for the proper operation of all the units. When one belt goes all of 'em have to be replaced.



Fan fording switch in wrong position (some equipment has a switch or handle to disengage fan for fording. The control must be set for normal operations when not fording . . . forgetting to reset it will cause engine overheating and damage.)

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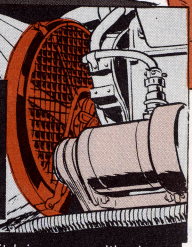

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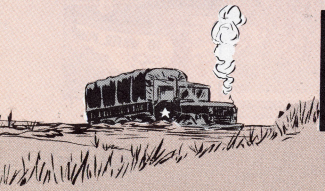
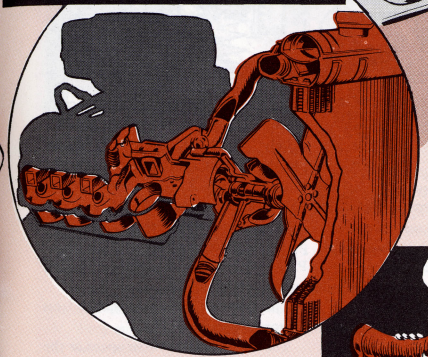


THERMOSTAT — Rusty, damaged, missing; valve weak or stuck. Wrong thermostat, or thermostat installed upside down. Housing leaky.

When the system's cleaned, the thermostat should be removed and tested in hot water for the required opening and closing temps, and if it fails to make the grade either way, it must be replaced.

ENGINE WATER JACKET —Leaky, clogged. Head bolts loose, damaged, head gasket installed wrong. Corrosion, rust, clogging or leaks inside jacket.

Installation of head gasket and torquing of engine head bolts must be by the book to prevent leakage and damage in the engine and in the cooling system.



WATER PUMP — Worn, loose, damaged, sucking air, leaky. Belt cracked, worn, frayed, too tight or loose.

(Most water pumps are sealed, but some need lube. When grease is needed, the type and lubing frequency will be noted in the LO or maintenance SOP.) Impeller loose, or corroded.

OTHER HOSES, LINES, TUBES, PLUGS, FITTINGS, GASKETS, CONNECTORS
Leaks or damage in cooling system hoses or lines to heaters or other components using coolant; at connections of cylinder-head distribution or by-pass line or tube, at the connections or in the supported components.

POPS MORE

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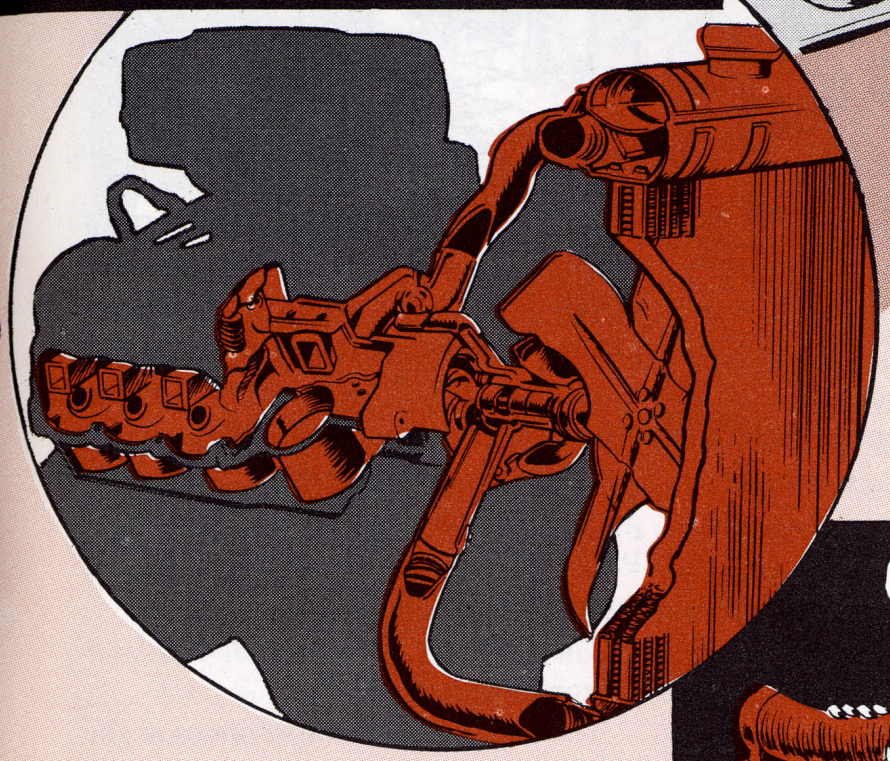

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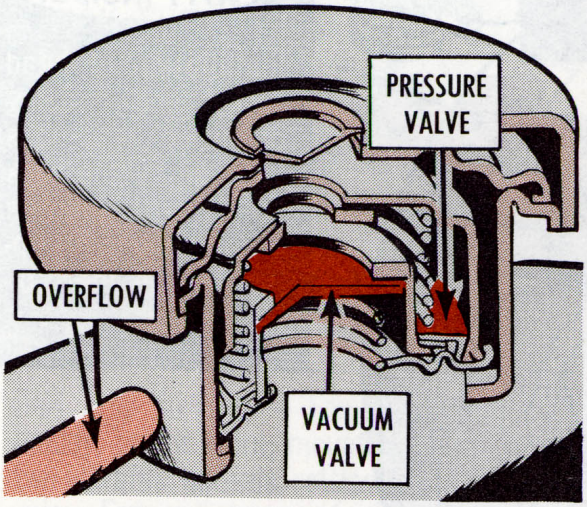
P.S MORE

RADIATOR

The radiator stores and cools the water. It has a bottom tank to hold the cooled water for recirculation and a top tank to receive the hot water from the engine water jacket (some tanks are on the sides of the radiator).

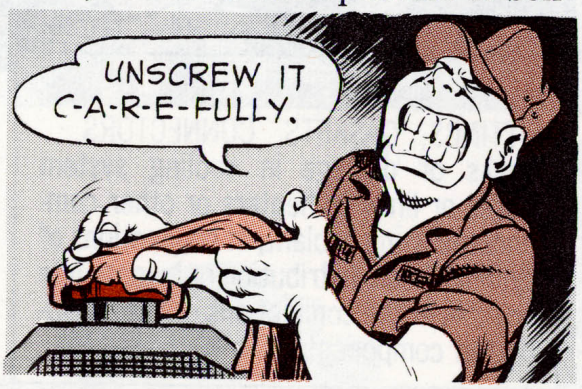
The radiator cap is a very vital part of the cooling system. It seals the system so a fair amount of pressure builds up, so you have to make sure your equipment has the right pressure cap.

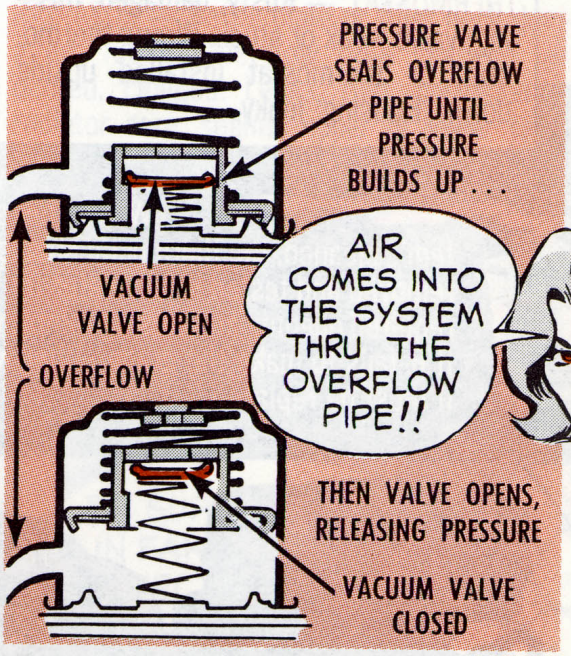


With coolant under pressure the engine can operate at much higher temps without the coolant boiling over.

The cap has a pressure safety valve, a vacuum valve and a gasket.

The pressure valve seals the overflow pipe during normal operating temperatures, but when steam pressure or boiling coolant force the valve open, the overflow pipe is opened to release the expansion.



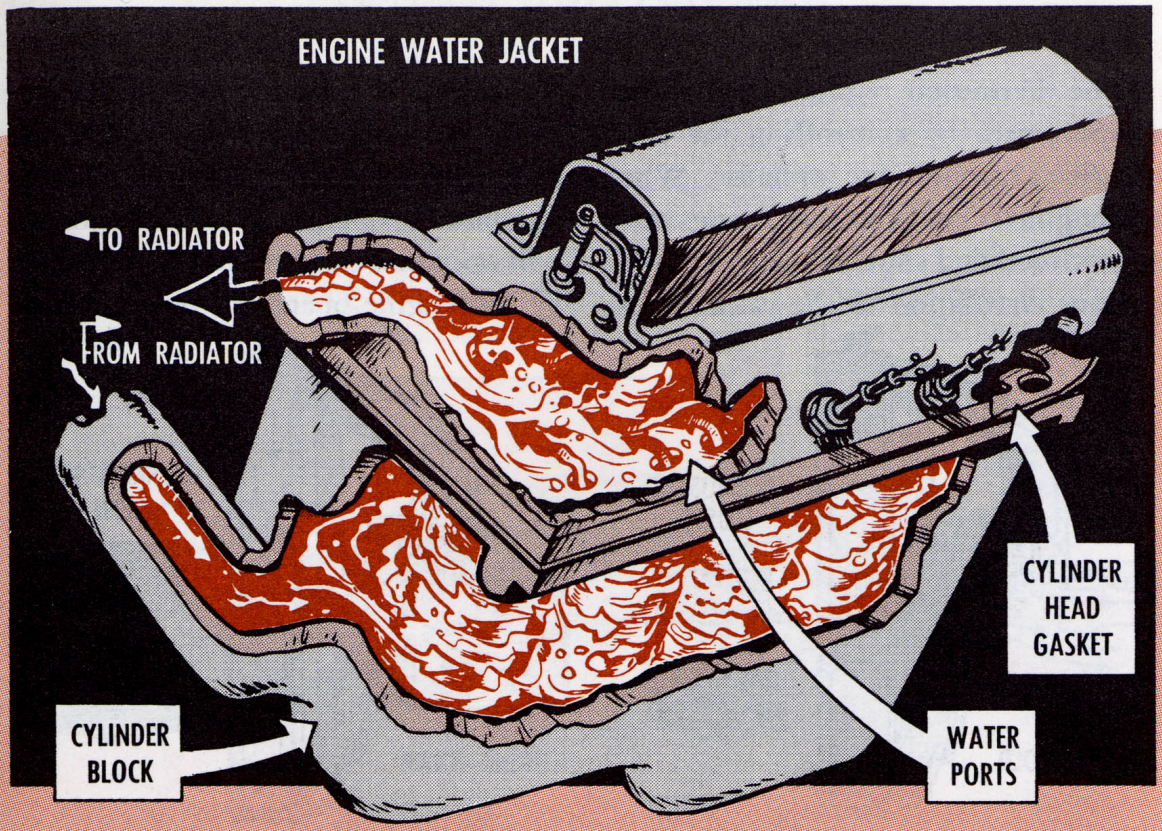


On most transport vehicles the cap's pressure valve is set to open at approximately 7 or 13 PSI. At 7 PSI, for example, the coolant's boiling point is raised to around 234°F, at sea level. At 13 PSI it's raised to about 251°F.

On some combat vehicles the cap's pressure opening is set as high as 17 PSI, which raises the coolant boiling point to about 263°F.

The pressure rating is stamped on the top of each cap.

The cap's vacuum valve opens as the engine cools and the system's pressure drops below the outside air pressure. As the vacuum valve opens, air rushes into the system through the overflow pipe. The automatic suction of air prevents the collapse of the hoses and thin, unsupported parts in the system. When the system's pressure and the outside pressure are about the same the vacuum valve closes.



Water passages in the cylinder block and the cylinder head form the water jacket. In the block the water jacket surrounds the cylinder liner and passages between the cylinders let the water circulate around the cylinders. Water passages also protect other hot spots on the block, and plates or baffles may also be used to help the circulating coolant hit the hot sections. The engine may also have a water distribution line or tube which aims coolant at the cylinders and the valve seats.

Water ports between the cylinder block and the cylinder head let the coolant flow into the cylinder head to cool the top of the cylinders and the valves. Or, there may be small water jets or nozzles built into the cylinder head to cool the valve seats.

The engine head gasket, along with its other important sealing chores in the combustion chamber, provides the seal that keeps coolant out of the combustion chamber, and fumes and fuel contamination from leaking into the water jacket.

Water remains in the water jacket, just as it does in the radiator, whether the engine is running or not.

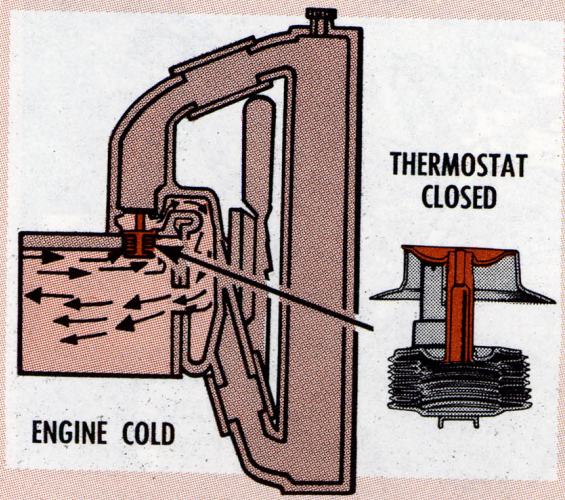
WATER PUMP: HEART OF THE SYSTEM

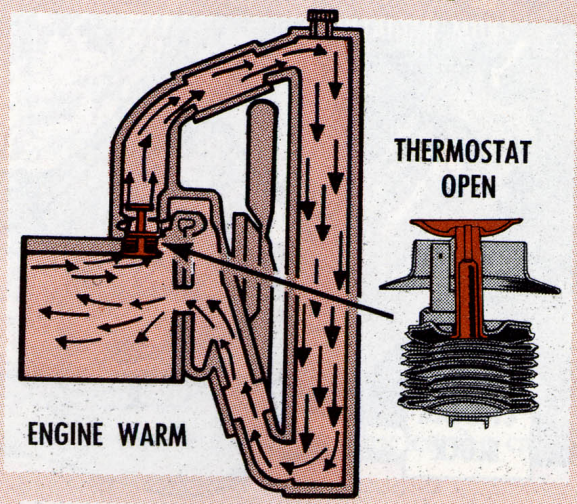
The pump takes cooled water from the radiator's lower tank and forces it into the engine water jacket. To do a proper cooling job some pumps may have to circulate between 4,000 and 10,000 gallons of water an hour.

PS MORE

THERMOSTAT

The thermostat regulates the engine temperatures by controlling the coolant flow through the radiator. When the engine is cold the thermostat valve stays closed and shuts off practically all coolant circulation to the radiator. As the engine warms up, the thermostat valve opens gradually to allow the complete cooling cycle to begin. During equipment operation the thermostat will open and close as often as called for by the engine operating temperatures.

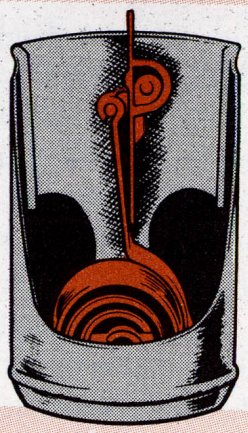




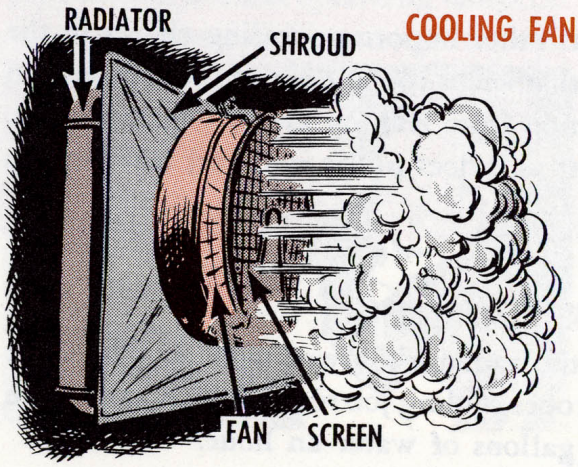
The 2 common thermostats used are the bellows type and the metal spring type.

The bellows type contains a liquid that'll create gas pressure, so the bellows expand when the coolant reaches a given temperature.

The other type is forced open as the coolant heat expands the bimetallic coil (spring).



METAL SPRING THERMOSTAT.



COOLING FAN AND SHROUD

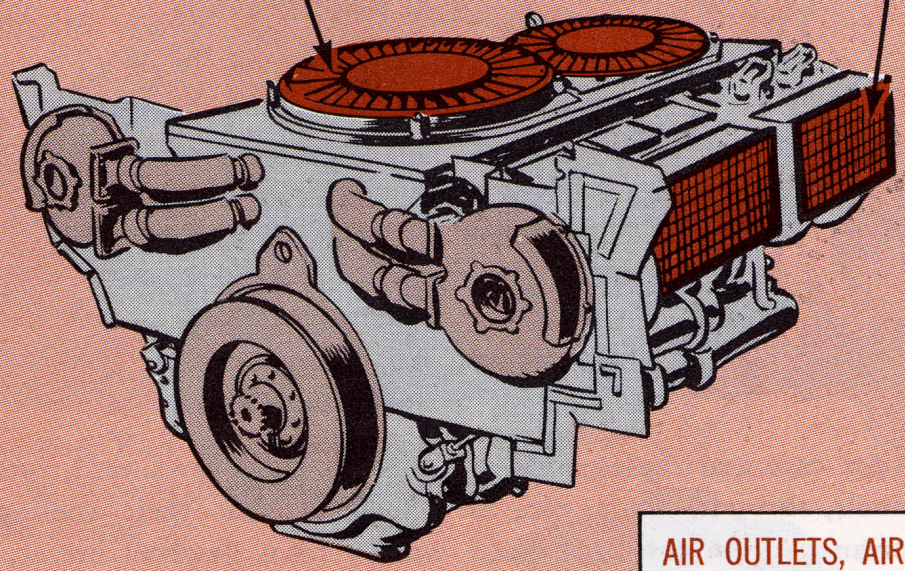
The fan pulls outside air in through the radiator core to cool the water tubes, fins and the coolant. With help from the radiator shroud the fan also blows or draws cool air directly on, over or across the hot engine. The fan is belt driven, runs off the crankshaft and normally shares a pulley with the water pump, generator or some other component.

AIR COOLING SYSTEM CHECK POINTS

The big things to watch on an air cooling system are:

FANS/BLOWERS/ROTORS — Binding, noisy, damaged, dirty, clogged. Shafts or clutch assemblies worn, damaged, leaky. Fan blades, rotor fins cracked, bent, dirty. Fan housing or towers damaged, loose, clogged with trash.

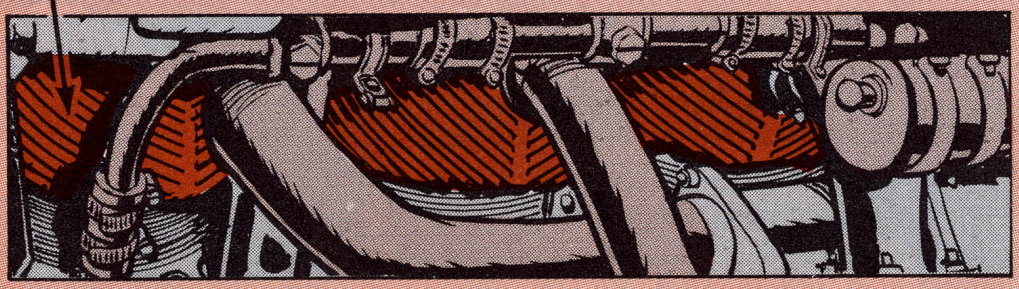
OIL COOLERS — Radiator cores leaking, fins damaged, clogged. Cooler mountings loose. Oil tube clogged. Oil lines dirty, leaky, damaged.



AIR OUTLETS, AIR INLETS, SHUTTERS, GRILLES, VANES, SCREENS, PANELS, DOORS — Damaged, stuck, blocked, missing, installed wrong; their seals, gaskets or attachments worn, damaged, missing, installed wrong.

CYLINDER COOLING FINS — Bent, cracked, smashed, blocked, grimy, clogged.

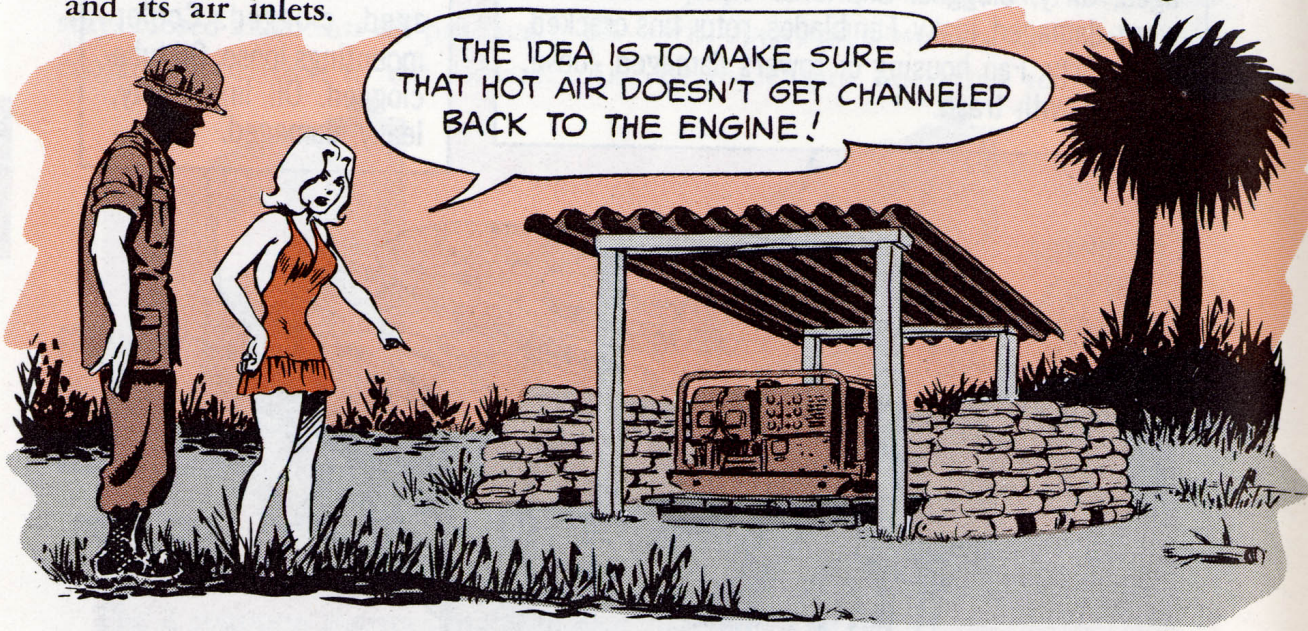
CYLINDER BAFFLES, SHROUDS — Bent, cracked, loose, missing, installed wrong, dirty.



P.S MORE

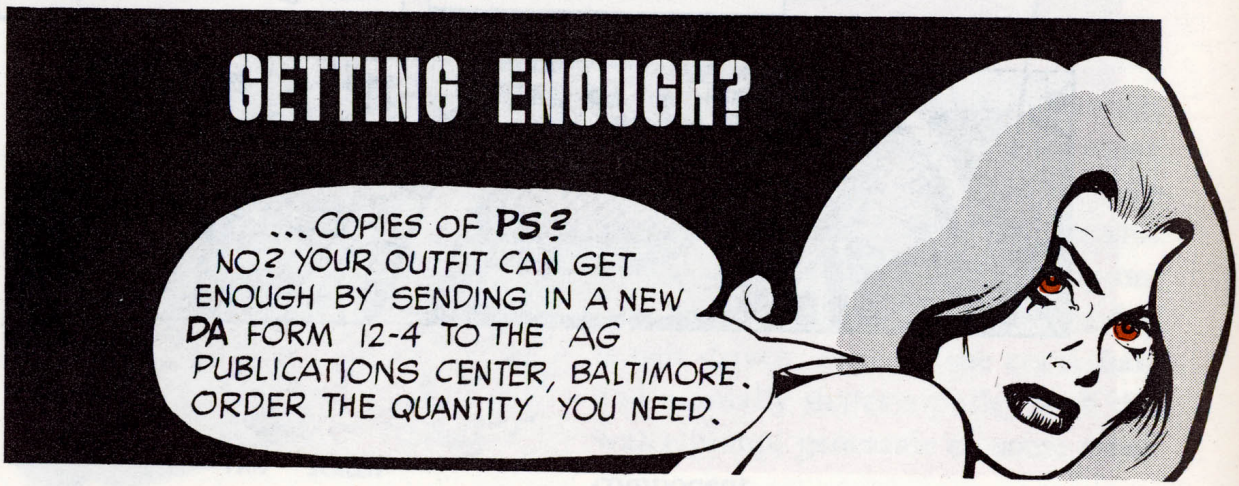
STATIONARY OR MOUNTED EQUIPMENT

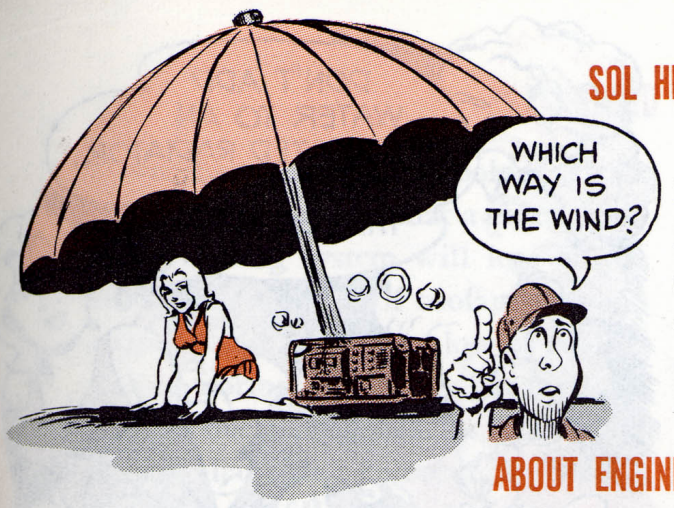
On things like generators, compressors and other engine-powered tools or support equipment, you also have to make sure that the equipment has plenty of breathing space—that it's not crowded by other equipment, walls, tents, fences, embankments or protectors, that'll block the flow of air to the engine and its air inlets.



The proper care and replacement of hoods, panels, shrouds, doors, etc., is very important. They must be in place and in good shape for the cooling system to work right.

When you get down to the 1- and 2-cylinder engines used on some tools and equipment (small generators, compressors, chain saws, etc.), you have to remember that their cooling comes mostly from flywheel breeze, shrouding and the normal circulation of air around them. So you have to keep 'em clean, uncluttered and unblocked so they're hit by outside air from all directions.



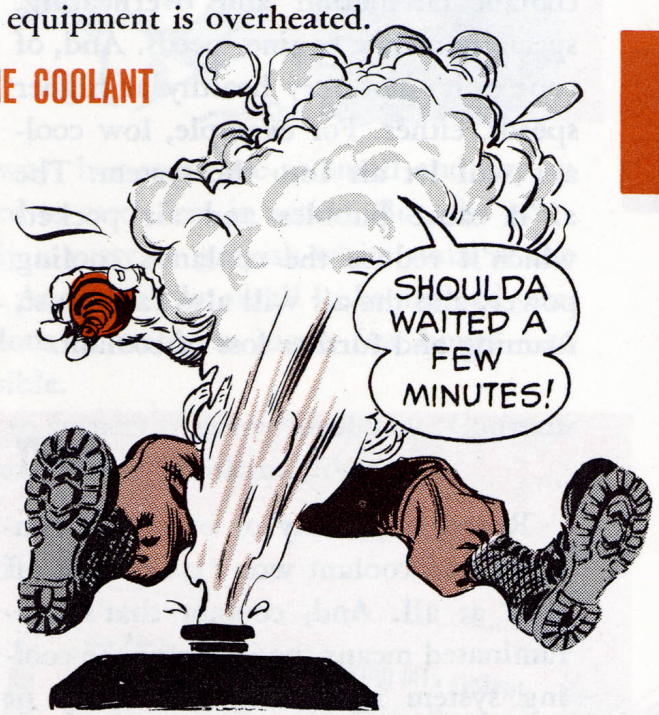


SOL HEAT

On any piece of equipment, regardless of size or MOS, it'll help the cooling system a lot if you shade the engine some from the direct sun blast — whenever possible. It's especially helpful to point an engine upwind when the equipment is overheated.

ABOUT ENGINE COOLANT

Keeping the coolant solution clean and at the right level is top priority PM. And, a good point to remember in checking coolant is that coolant expands and its level rises as the engine warms up, and the level falls as the engine cools. So, whenever you're refilling the radiator you have to recheck the coolant level after the engine has reached operating temperature to get a true reading. Run the engine a few minutes and then recheck the coolant before you re-start 'er.



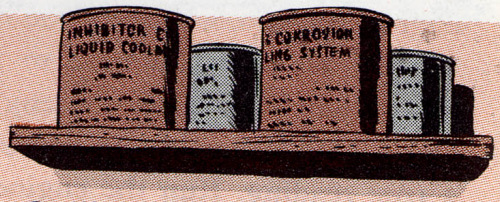
The coolant should be visible at the bottom of the filler neck, or just so much over the radiator baffle plate. But, exact level and filling SOP will vary with different equipment, so that's PM SOP you have to learn by heart for your equipment.

P.S MORE

Overfilling, or filling when the engine is cold, can cause coolant overflow or coolant waste. And, repeated overfilling will weaken the coolant's antifreeze and rust inhibitor protection.

On the other hand, with a short measure of coolant you'll have poor coolant circulation and overheating, specially at low engine speeds. And, of course, it's not very healthy at higher speeds, either. For example, low coolant will let air into the system. The air'll cause bubbles and air pockets which'll reduce the coolant's cooling power, and the air will also cause rust, foaming and further loss of coolant.

FILTHY COOLANT



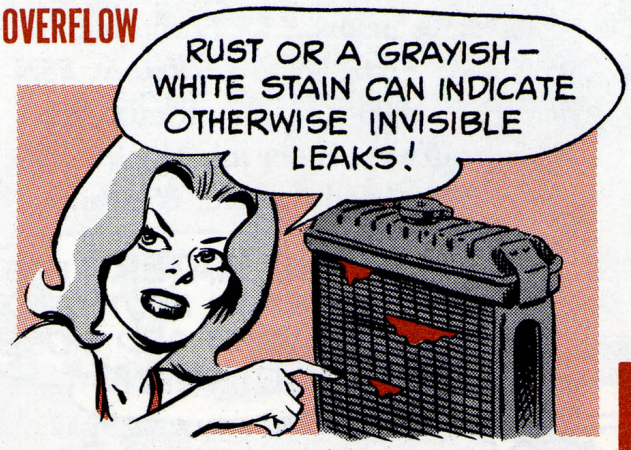
Rusty, oily, scaly or otherwise contaminated coolant won't carry heat off well at all. And, coolant that's contaminated means the inside of the cooling system is hurting—it's rusty or scaly, or it's got inside leakage, or it's been getting dirty water. You've got to drain contaminated coolant as soon as possible and clean the cooling system before you add new coolant.

Cleaning a cruddy cooling system normally calls for Cleaning Compound, FSN 6850-598-7328. But, cleaning and flushing and use of the compound take special care and know-how. On most equipment it can be done by the organizational maintenance experts, but on some engines the job is done by support. See your trusty TM.

Use of the cleaner is covered in TB 750-651 (Nov 68), Use of Antifreeze Solutions and Cleaning Compounds in Engine Cooling Systems. The equipment TM's and TM 9-2858, with Changes 1 and 2, (May 45), Cooling Systems: Vehicles and Powered Ground Equipment, also give info on cooling system cleaning, flushing and use of the cleaner. And, a page of instructions also comes with the stuff.

When you clean a cooling system, the fresh water gets a batch of Corrosion Inhibitor, FSN 6850-753-4967. It comes in a 6-oz can, and you mix it 1 ounce to each 2 quarts of water. The stuff comes in a light powdered form, though, and has to be mixed with warm water before it's added to the radiator. It won't dissolve completely in the warm water, but the important thing is that the solution doesn't have any lumps.

LEAKS AND OVERFLOW



Another important coolant check point to remember is that a clean, leak-proof cooling system will lose only a very small amount of coolant through evaporation. Any heavy loss of coolant during normal operations means leakage or overflow problems. Problems, that is, that won't be solved by simply filling and refilling the radiator.

A damp spot will give most leaks away, but some are so small and dry so fast when the engine is hot, that it's hard to catch 'em in action. But, the give-away on slow, persistent leaks is usually a rusty or grayish-white stain at the leak point, or wherever the coolant hits. And, don't let small leaks mislead you. They can rob a cooling system of gallons of water in just a few hours—so they've got to be stopped as soon as possible.

When leaks aren't obvious, you have to suspect overflow problems. Constant coolant overflow and overheating can mean real problems, like:

- Exhaust fumes leaking into cooling system.
- Ignition or valve timing off.
- Radiator tubes clogged; fins, air passages damaged, blocked.
- Hot spots (from corroded, clogged water jacket).
- Leaky oil cooler.
- Radiator pressure cap damaged.
- Cylinder head gasket shot, installed wrong.
- Water-pump impeller loose, corroded.
- Air in coolant (air leaking into system through damaged hose, through loose radiator or pump connections.)
- Thermostat stuck shut or installed upside down.
- Distributor tube clogged or replaced wrong.
- Radiator hose collapsed.
- Fan or water pump belt damaged, out of adjustment. Belts not replaced as a matched set.
- Muffler clogged, exhaust pipe bent.

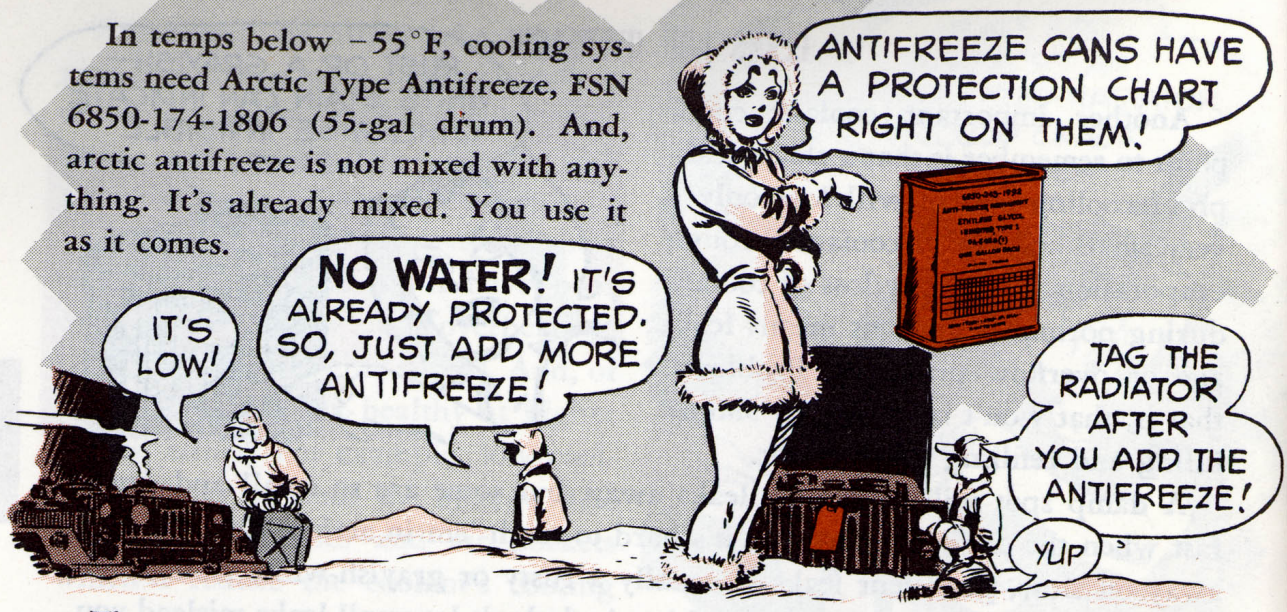
ANTIFREEZE NOTES

And, natch, antifreeze (ethylene glycol) is a must for liquid cooling systems in temperatures ranging from +32°F to −55°F. It comes under:

FSN 6850-243-1992 (1-gal can)
FSN 6850-224-8730 (5-gal can)
FSN 6850-243-1990 (55-gal drum)

P.S MORE

In temps below −55°F, cooling systems need Arctic Type Antifreeze, FSN 6850-174-1806 (55-gal drum). And, arctic antifreeze is not mixed with anything. It's already mixed. You use it as it comes.



The exact time for adding antifreeze is normally set by local maintenance SOP. Instructions on use and care of antifreeze are in equipent TM's, TB 750-651 and TM 9-2858.

Antifreeze has a high boiling point, it doesn't readily evaporate in use, and it gives complete protection from freezing when used in the right amounts. A mix of 40 percent water and 60 percent antifreeze, for example, will protect at temperatures as low as −65°F.

But whatever mix you use, you'll need to test the batch with a hydrometer to be sure you have the protection you'll need. Once the cooling system gets its antifreeze, you use the hydrometer to test its strength when you have to add water to the radiator. And, so nobody'll goof up your solution, you tie a tag, giving antifreeze info, on the radiator filler neck.

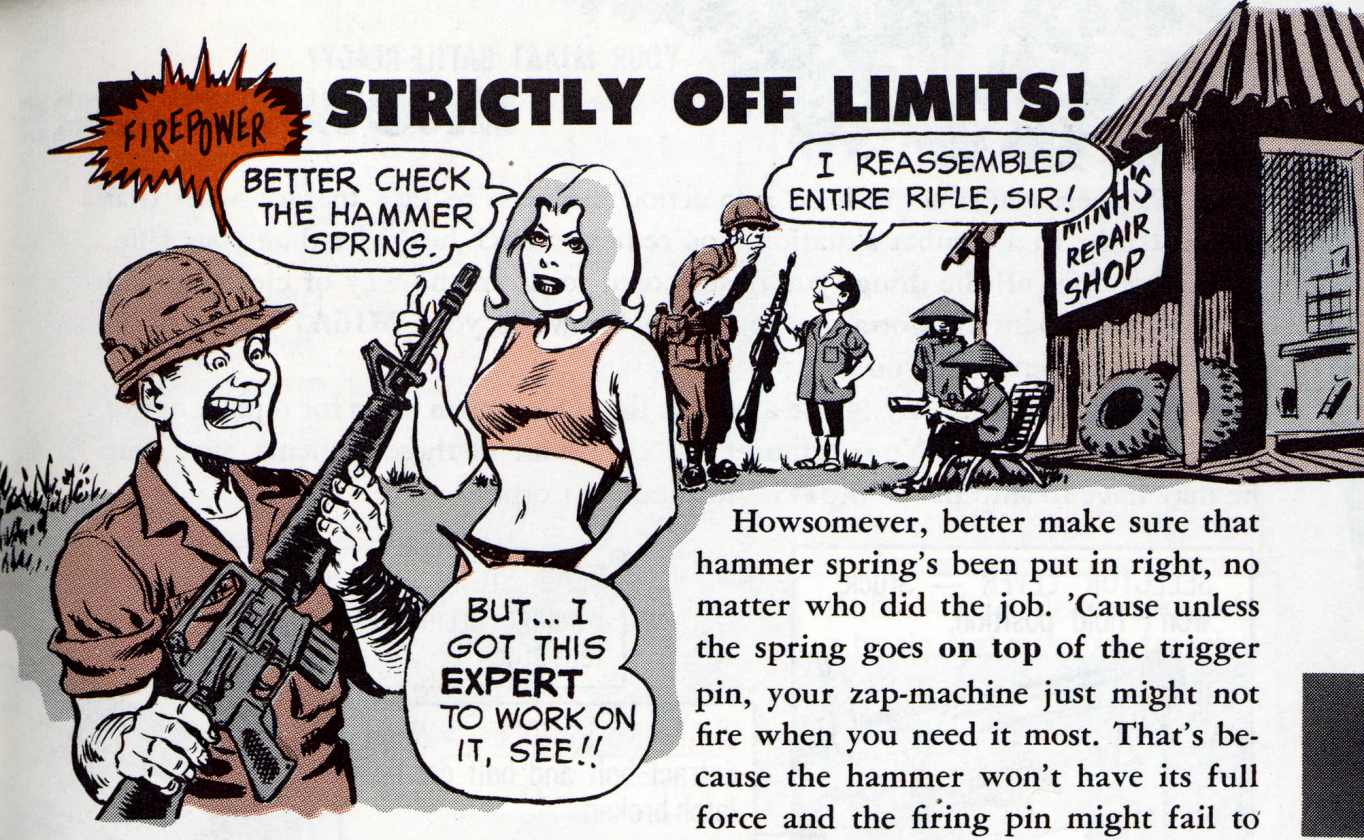
Antifreeze doesn't carry off engine heat as efficiently as plain water does. So, during antifreeze season you have to keep an even closer check on coolant level and condition, and you keep an eye peeled for any sneaky leaks.

At the end of cold weather, you drain the cooling system and dump the antifreeze. The cooling system gets a fresh batch of clean water and some corrosion inhibitor.

Keep arctic antifreeze in all year round, as long as tests show that its corrosion inhibitor is still good.

And, when the antifreeze is drained is a real good time to give the cooling system a complete going over for leaks, damage, rust, proper adjustment, etc., from the thermostat right down to the water pump.

STRICTLY OFF LIMITS!



Word's around that some riflemen and armorers are fouling up working parts in the lower receiver of their M16A1's—like putting the hammer spring or sear assembly in bassackwards.

But, whoa, back up!

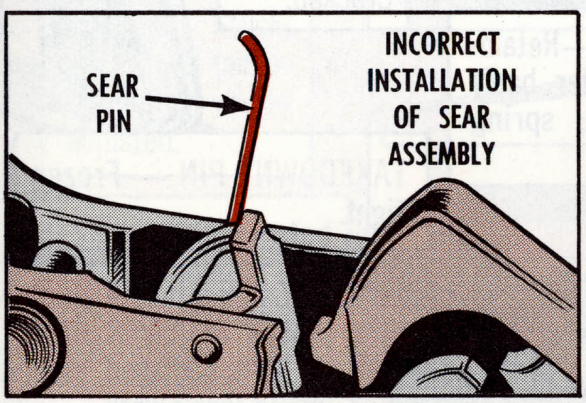
Lower receiver parts are OFF LIMITS to anybody below the DS level. So, please to keep your mitts outta there . . . except for necessary cleaning and lubing, o'course. No matter what you may have read or heard any where any time, this is like it is, Man!

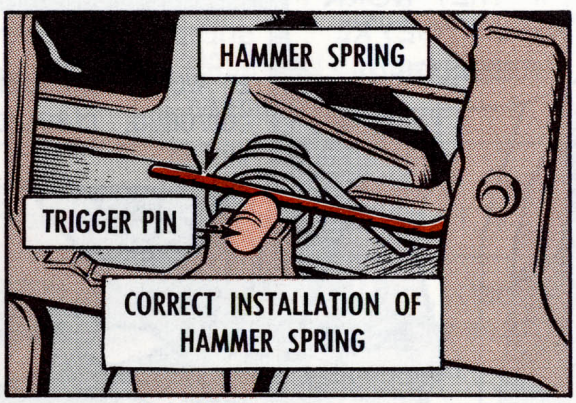
Howsomever, better make sure that hammer spring's been put in right, no matter who did the job. 'Cause unless the spring goes **on top** of the trigger pin, your zap-machine just might not fire when you need it most. That's because the hammer won't have its full force and the firing pin might fail to fire the primer.

Another thing, if the sear pin's sticking up in the air like a sore thumb, no automatic fire. Somebody goofed. Not only is the sear assembly installed wrong, but you could damage this spring when you close the receiver.

So, check your weapon. If the hammer spring's on top of the trigger pin, she's OK.

But, if the hammer spring's under the trigger pin or if the sear spring's pointed toward the sky, get your rifle to DS pronto.





YOUR M16A1 BATTLE-READY?

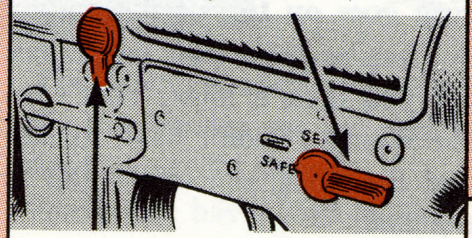
KNOW BEFORE

So, Zapper, you're set to head into action and you're face to face with that naked truth: In a combat situation, you're never much healthier than your rifle.

You've done all the things you're supposed to do in the way of cleaning and lubing, but when you gotta go, you gotta know: Is your M16A1 really fit to make the big scene with you?

If your weapon has any of the ailments listed here, turn 'er in for repairs or get another that's healthy. Your armorer can cure some of these ailments, sure, but he may have to ship her to the DS "hospital" for others.

SELECTOR LEVER — Stuck, won't hold position.



BOLT CATCH — Won't hold in open position.

REAR SIGHT — Ears bent, windage drum damaged, detent stuck.

CHARGING HANDLE — Won't extract bolt and bolt carrier, latch broken.

FORWARD ASSIST ASSEMBLY — Won't close bolt.

BUTT STOCK — Stock turns, loose, separated from lower receiver; swivel base busted or pin missing; butt cap screw missing, won't hold; any deep cuts, cracks or breaks that weaken the stock.

AND LEAVE THE COSMETICS TO ME... LEAVE THE BUTT AND HANDGUARDS ALONE... IF THEY WORK WELL... THEY'RE BEAUTIFUL!

LOWER RECEIVER — Cracked.

BUFFER ASSEMBLY — Retainer won't hold; buffer badly corroded, cracked; spring kinked.

TAKEDOWN PIN — Frozen tight.

TRIGGER MECHANISM AND LOWER RECEIVER CAVITY — — Parts damaged, assembled wrong, won't work.

YOUR M16A1 BATTLE-READY?

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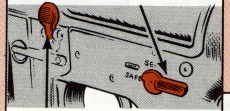

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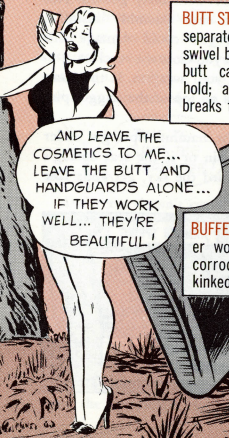

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TRIGGER MECHANISM AND LOWER RECEIVER CAVITY — — Parts damaged, assembled wrong, won't work.

FRONT SIGHT — Loose, bent, elevation detent and post stuck.

BARREL — Bulged; bore badly pitted.

EJECTION PORT (DUST) COVER — Won't open and close like it should. Missing.

BAYONET-KNIFE — Release spring weak, broken. Blade bent, broken.

FLASH SUPPRESSOR — Loose, busted.

BAYONET STUD — Busted.

HANDGUARDS — Deep cracks, cuts or breaks that make 'em too weak to trust; front and rear areas busted off, won't hold in place when slip ring's pushed up; slip ring damage that'd keep it from doing its job.

CHAMBER — Pitted.

UPPER RECEIVER — Cracked; locking lugs badly chipped; gas tube bent, badly dented.

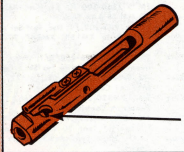
EJECTOR — Won't work.

MAGAZINE CATCH BUTTON — Stuck; won't hold magazine after you've adjusted.

MAGAZINE — Overloaded (more than 20 rounds); tube dented; lips bent; spring rusty, action weak; follower sticks.

CAM PIN — Missing, cracked.

BOLT — Cracked; face badly pitted; locking lugs chipped; rings busted.



BOLT CARRIER — Body cracked, badly pitted; firing pin well is corroded.

CARRIER KEY — Cracked, loose, badly corroded; gas port clogged; carrier and key screws sheared off, missing.

FIRING PIN — Cracked, blunted, missing.

FIRING PIN RETAINING PIN — Busted, missing.

EXTRACTOR — Bent, cracked; claw damaged; spring weak or deformed, pin cracked.

YOU GO

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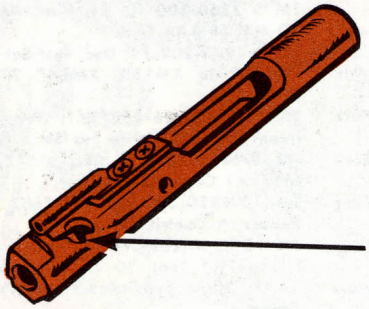

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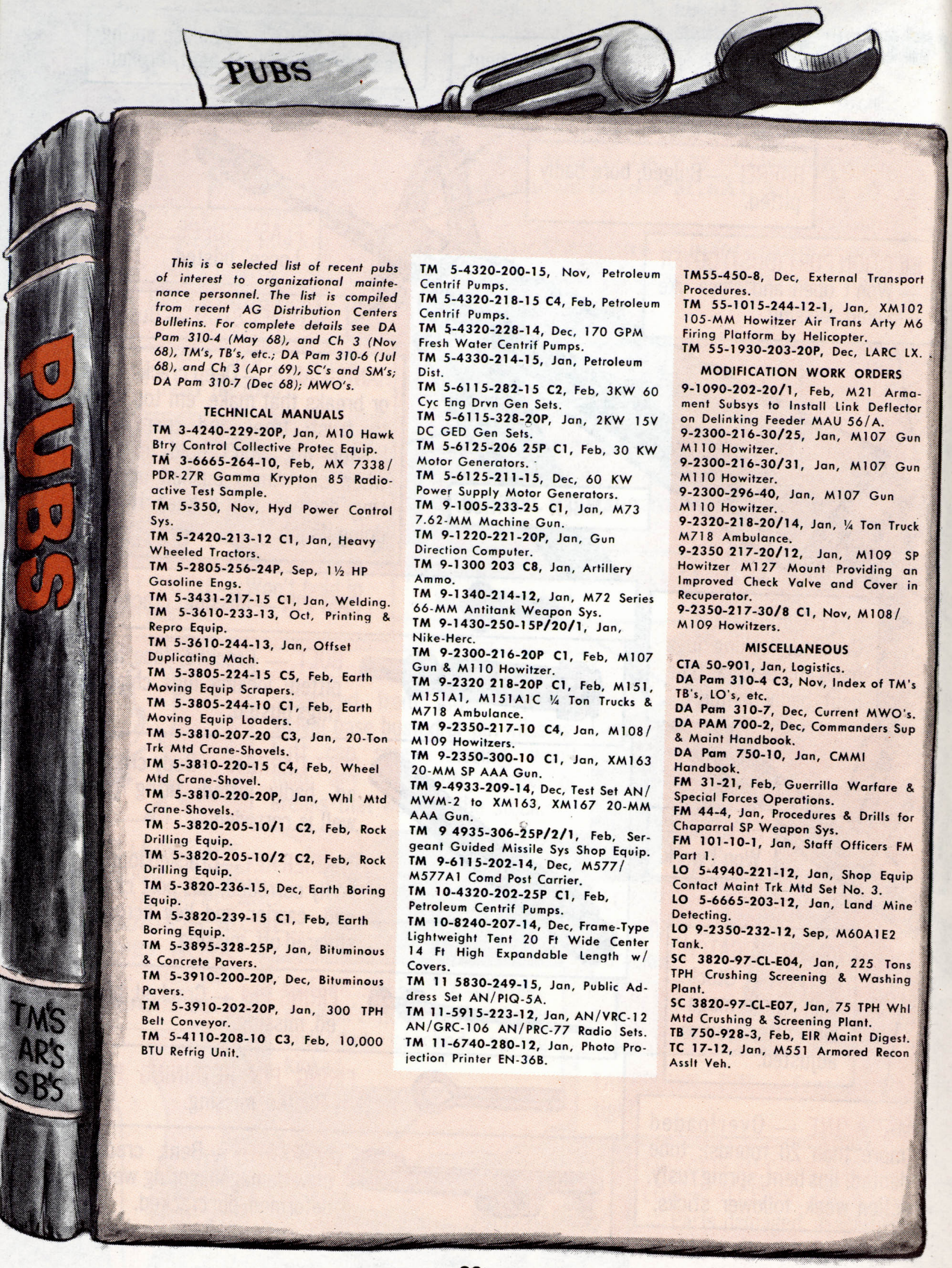


This is a selected list of recent pubs of interest to organizational maintenance personnel. The list is compiled from recent AG Distribution Centers Bulletins. For complete details see DA Pam 310-4 (May 68), and Ch 3 (Nov 68), TM's, TB's, etc.; DA Pam 310-6 (Jul 68), and Ch 3 (Apr 69), SC's and SM's; DA Pam 310-7 (Dec 68); MWO's.

TECHNICAL MANUALS

TM 3-4240-229-20P, Jan, M10 Hawk Btry Control Collective Protec Equip.
TM 3-6665-264-10, Feb, MX 7338/PDR-27R Gamma Krypton 85 Radioactive Test Sample.
TM 5-350, Nov, Hyd Power Control Sys.
TM 5-2420-213-12 C1, Jan, Heavy Wheeled Tractors.
TM 5-2805-256-24P, Sep, 1½ HP Gasoline Engs.
TM 5-3431-217-15 C1, Jan, Welding.
TM 5-3610-233-13, Oct, Printing & Repro Equip.
TM 5-3610-244-13, Jan, Offset Duplicating Mach.
TM 5-3805-224-15 C5, Feb, Earth Moving Equip Scrapers.
TM 5-3805-244-10 C1, Feb, Earth Moving Equip Loaders.
TM 5-3810-207-20 C3, Jan, 20-Ton Trk Mtd Crane-Shovels.
TM 5-3810-220-15 C4, Feb, Wheel Mtd Crane-Shovel.
TM 5-3810-220-20P, Jan, Whl Mtd Crane-Shovels.
TM 5-3820-205-10/1 C2, Feb, Rock Drilling Equip.
TM 5-3820-205-10/2 C2, Feb, Rock Drilling Equip.
TM 5-3820-236-15, Dec, Earth Boring Equip.
TM 5-3820-239-15 C1, Feb, Earth Boring Equip.
TM 5-3895-328-25P, Jan, Bituminous & Concrete Pavers.
TM 5-3910-200-20P, Dec, Bituminous Pavers.
TM 5-3910-202-20P, Jan, 300 TPH Belt Conveyor.
TM 5-4110-208-10 C3, Feb, 10,000 BTU Refrig Unit.
TM 5-4320-200-15, Nov, Petroleum Centrif Pumps.
TM 5-4320-218-15 C4, Feb, Petroleum Centrif Pumps.
TM 5-4320-228-14, Dec, 170 GPM Fresh Water Centrif Pumps.
TM 5-4330-214-15, Jan, Petroleum Dist.
TM 5-6115-282-15 C2, Feb, 3KW 60 Cyc Eng Drvn Gen Sets.
TM 5-6115-328-20P, Jan, 2KW 15V DC GED Gen Sets.
TM 5-6125-206 25P C1, Feb, 30 KW Motor Generators.
TM 5-6125-211-15, Dec, 60 KW Power Supply Motor Generators.
TM 9-1005-233-25 C1, Jan, M73 7.62-MM Machine Gun.
TM 9-1220-221-20P, Jan, Gun Direction Computer.
TM 9-1300 203 C8, Jan, Artillery Ammo.
TM 9-1340-214-12, Jan, M72 Series 66-MM Antitank Weapon Sys.
TM 9-1430-250-15P/20/1, Jan, Nike-Herc.
TM 9-2300-216-20P C1, Feb, M107 Gun & M110 Howitzer.
TM 9-2320 218-20P C1, Feb, M151, M151A1, M151A1C ¼ Ton Trucks & M718 Ambulance.
TM 9-2350-217-10 C4, Jan, M108/M109 Howitzers.
TM 9-2350-300-10 C1, Jan, XM163 20-MM SP AAA Gun.
TM 9-4933-209-14, Dec, Test Set AN/MWM-2 to XM163, XM167 20-MM AAA Gun.
TM 9 4935-306-25P/2/1, Feb, Sergeant Guided Missile Sys Shop Equip.
TM 9-6115-202-14, Dec, M577/M577A1 Comd Post Carrier.
TM 10-4320-202-25P C1, Feb, Petroleum Centrif Pumps.
TM 10-8240-207-14, Dec, Frame-Type Lightweight Tent 20 Ft Wide Center 14 Ft High Expandable Length w/ Covers.
TM 11 5830-249-15, Jan, Public Address Set AN/PIQ-5A.
TM 11-5915-223-12, Jan, AN/VRC-12 AN/GRC-106 AN/PRC-77 Radio Sets.
TM 11-6740-280-12, Jan, Photo Projection Printer EN-36B.
TM55-450-8, Dec, External Transport Procedures.
TM 55-1015-244-12-1, Jan, XM102 105-MM Howitzer Air Trans Arty M6 Firing Platform by Helicopter.
TM 55-1930-203-20P, Dec, LARC LX.

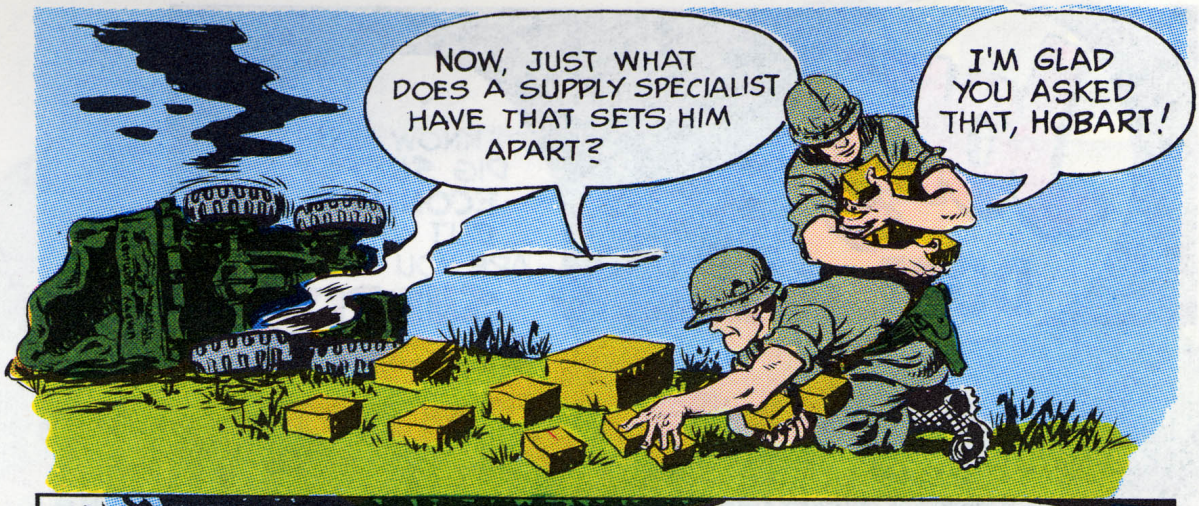
MODIFICATION WORK ORDERS

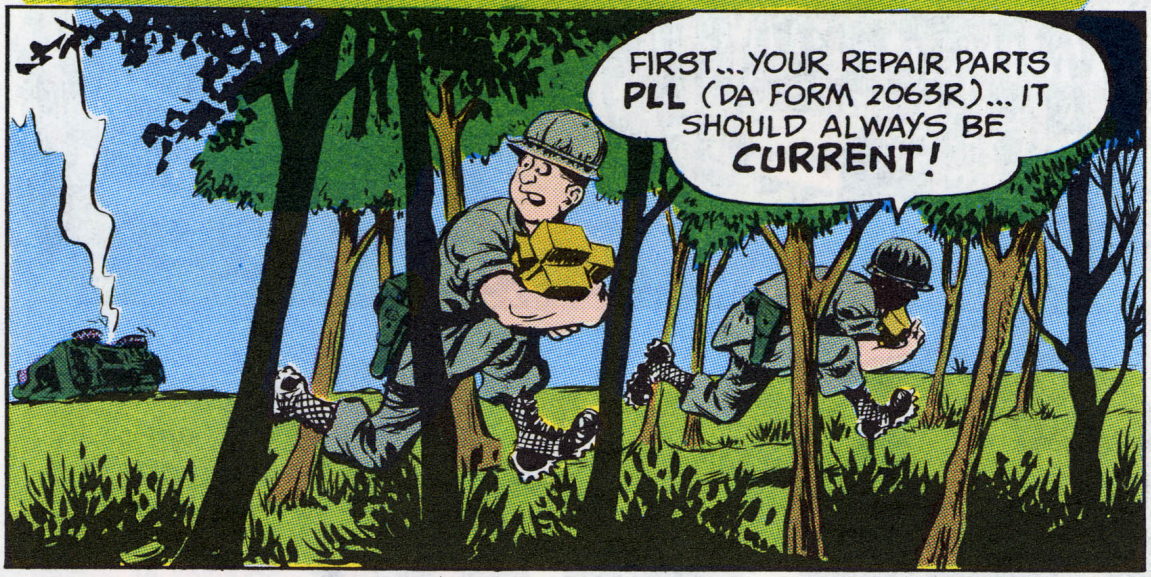
9-1090-202-20/1, Feb, M21 Armament Subsys to Install Link Deflector on Delinking Feeder MAU 56/A.
9-2300-216-30/25, Jan, M107 Gun M110 Howitzer.
9-2300-216-30/31, Jan, M107 Gun M110 Howitzer.
9-2300-296-40, Jan, M107 Gun M110 Howitzer.
9-2320-218-20/14, Jan, ¼ Ton Truck M718 Ambulance.
9-2350 217-20/12, Jan, M109 SP Howitzer M127 Mount Providing an Improved Check Valve and Cover in Recuperator.
9-2350-217-30/8 C1, Nov, M108/M109 Howitzers.

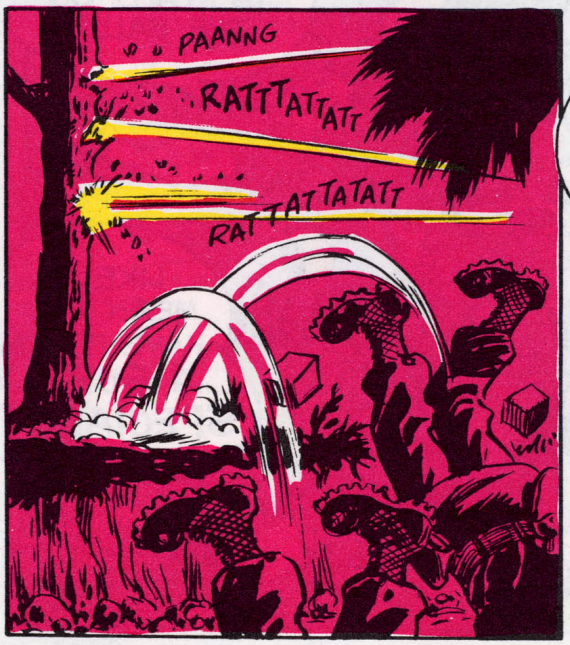
MISCELLANEOUS

CTA 50-901, Jan, Logistics.
DA Pam 310-4 C3, Nov, Index of TM's TB's, LO's, etc.
DA Pam 310-7, Dec, Current MWO's.
DA PAM 700-2, Dec, Commanders Sup & Maint Handbook.
DA Pam 750-10, Jan, CMMI Handbook.
FM 31-21, Feb, Guerrilla Warfare & Special Forces Operations.
FM 44-4, Jan, Procedures & Drills for Chaparral SP Weapon Sys.
FM 101-10-1, Jan, Staff Officers FM Part 1.
LO 5-4940-221-12, Jan, Shop Equip Contact Maint Trk Mtd Set No. 3.
LO 5-6665-203-12, Jan, Land Mine Detecting.
LO 9-2350-232-12, Sep, M60A1E2 Tank.
SC 3820-97-CL-E04, Jan, 225 Tons TPH Crushing Screening & Washing Plant.
SC 3820-97-CL-E07, Jan, 75 TPH Whl Mtd Crushing & Screening Plant.
TB 750-928-3, Feb, EIR Maint Digest.
TC 17-12, Jan, M551 Armored Recon Asslt Veh.

JOE'S DOPE
I KNOW YOU DIG SUPPLY ECONOMY ...BUT WHERE ARE YOU WITHOUT SUPPLY DISCIPLINE!
MAISOUI RUBBER PLANTATION
UMPTY ARTILLERY
WITH SUPPLY DISCIPLINE A SUPPLY TYPE IS REALLY ON THE BALL!
BAM!
LIKE, YA MEAN IF I HAVE IT... I'M A SUPPLY SPECIALIST!

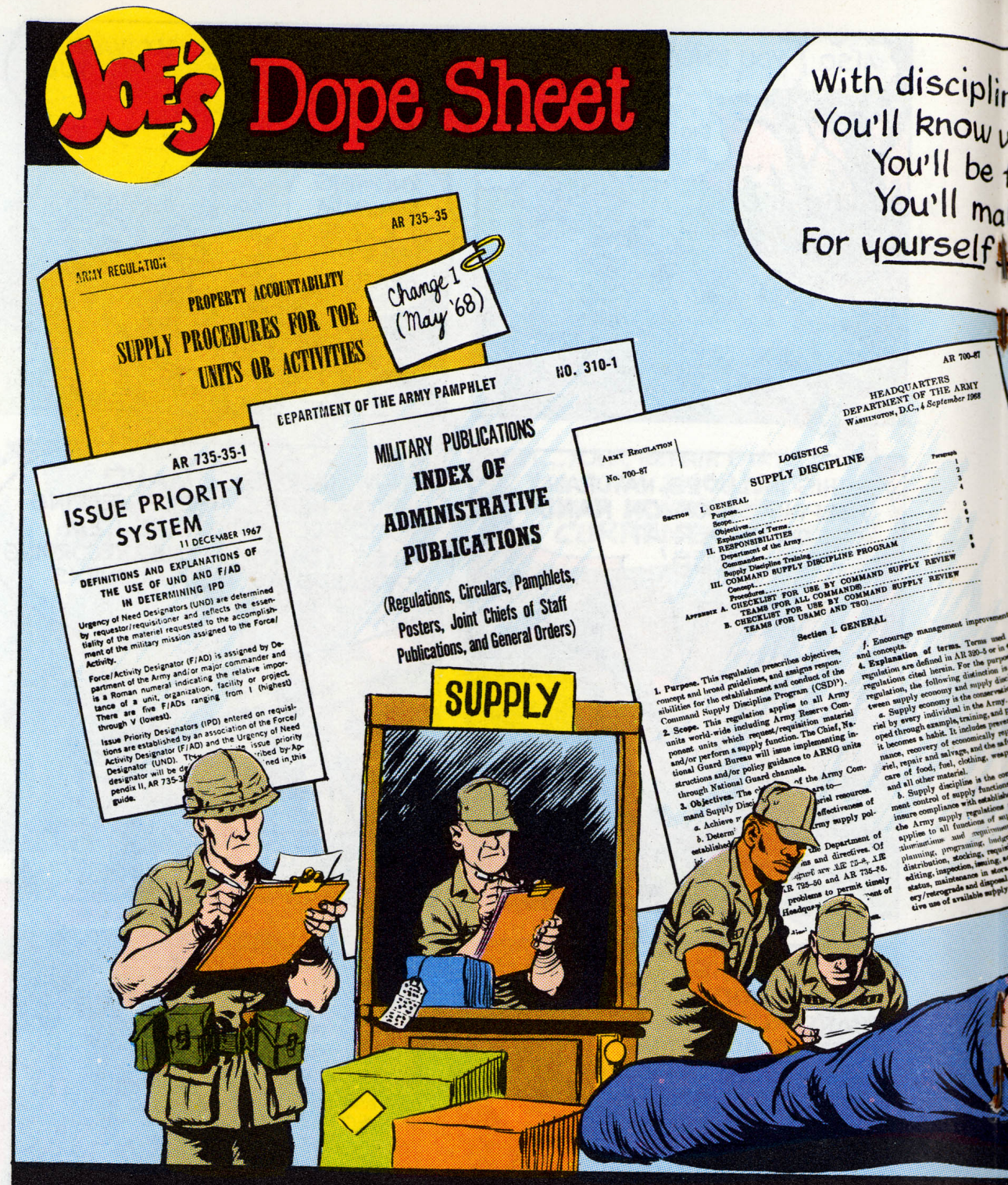

NOW, JUST WHAT DOES A SUPPLY SPECIALIST HAVE THAT SETS HIM APART?
I'M GLAD YOU ASKED THAT, HOBART!


FIRST... YOUR REPAIR PARTS PLL (DA FORM 2063R)... IT SHOULD ALWAYS BE CURRENT!


PAANNG
RATTTATTATT
RATTATTATATT

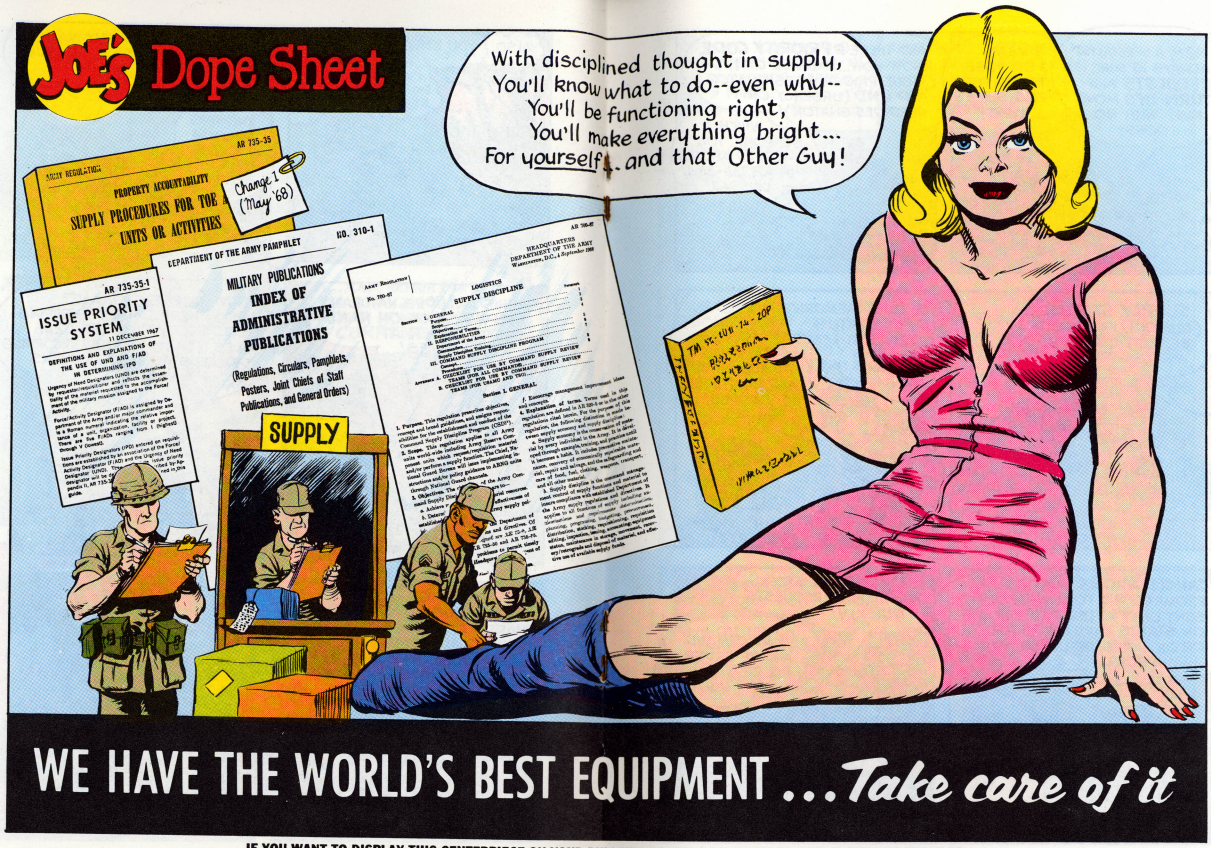
IT SHOULD BE ON HAND, AND PROPERLY MADE OUT... LIKE YOU SEND SUPPORT ITS COPY OF PLL PROMPTLY AND GIVE 'EM PLL CHANGES QUICKLY!!
SHHH

ALSO YOU KNOW YOUR SUPPLY PUBS...
Y'R INDEXES! DA PAM'S 310-1, -4, -6—FOR EXAMPLE... ETC.
-ON AUTHORIZED ALLOWANCES -KNOW HOW TO USE SUPPLY PUBS TO FIGURE UP ALLOWANCES AUTHORIZED.
LIKE KNOWING MINIMUM STOCKAGE ITEMS BY HEART!
-THIS INCLUDES, NATURALLY, KEEPING STOCK ON HAND OR ON ORDER AT ALL TIMES!
NOW, THERE'S DEMAND INFO! HERE'S WHERE KEEPING GOOD PLL AND FRINGE ITEM FILES, (DA FORM 3318) RECORDING DEMANDS AS THEY OCCUR IS A MUST!
LIKE REVIEWING YOUR CARDS QUARTERLY AND DELETING, ADJUSTING ALLOWANCES, CORRECTING FSN's... ALL ACCORDING TO AR 735-35 AND THE LOCAL SOP!
HEY!! HERE'S A PS PIN-UP ON THIS VERY SUBJECT ...NOW HOW DO Y'SUPPOSE IT GOT OUT HERE?



WE HAVE THE WORLD'S BEST EQ

IF YOU WANT TO DISPLAY THIS CENTERPIECE ON YOUR BUL

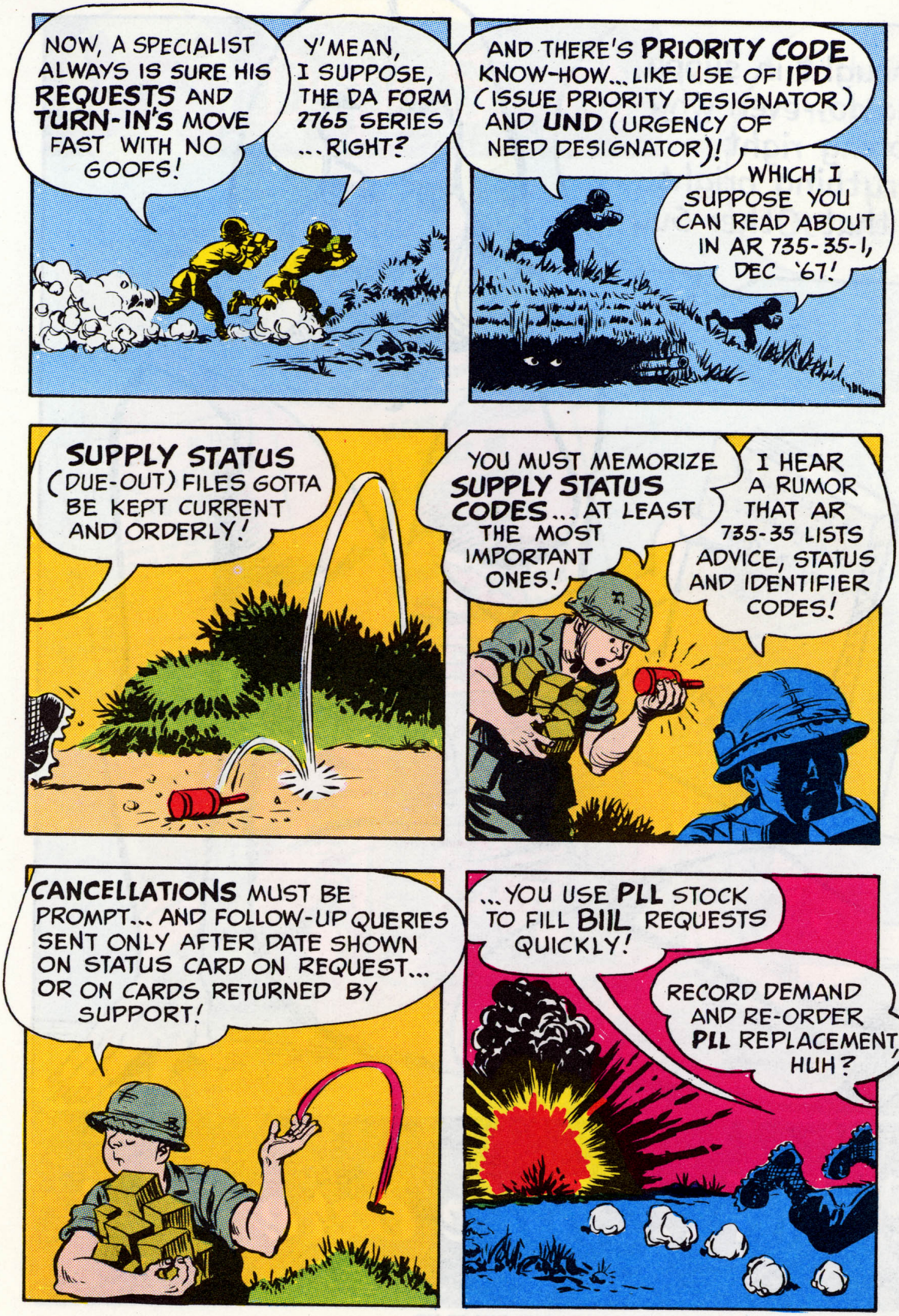


WE HAVE THE WORLD'S BEST EQUIPMENT ... *Take care of it*

IF YOU WANT TO DISPLAY THIS CENTERPIECE ON YOUR BULLETIN BOARD, OPEN STAPLES, LIFT IT OUT AND PIN IT UP.

QUIPMENT ... *Take care of it*

LLETIN BOARD, OPEN STAPLES, LIFT IT OUT AND PIN IT UP.

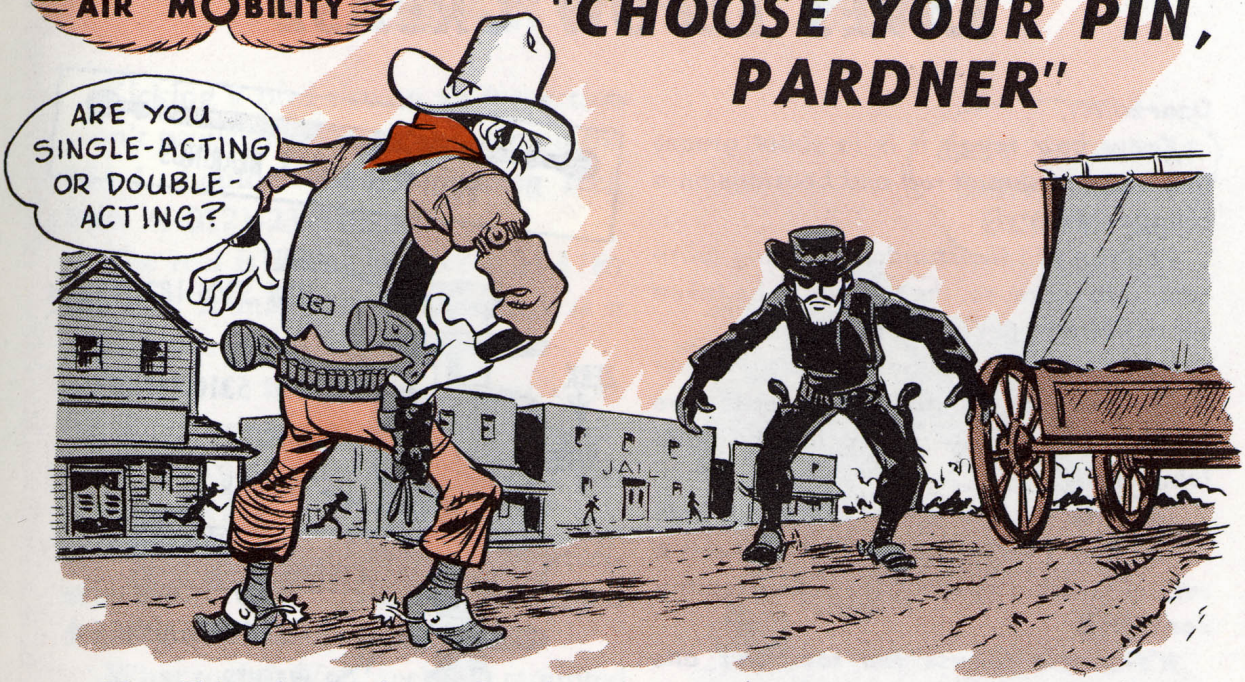

NOW, A SPECIALIST ALWAYS IS SURE HIS REQUESTS AND TURN-IN'S MOVE FAST WITH NO GOOFS!
Y'MEAN, I SUPPOSE, THE DA FORM 2765 SERIES ...RIGHT?
AND THERE'S PRIORITY CODE KNOW-HOW... LIKE USE OF IPD (ISSUE PRIORITY DESIGNATOR) AND UND (URGENCY OF NEED DESIGNATOR)!
WHICH I SUPPOSE YOU CAN READ ABOUT IN AR 735-35-1, DEC '67!
SUPPLY STATUS (DUE-OUT) FILES GOTTA BE KEPT CURRENT AND ORDERLY!
YOU MUST MEMORIZE SUPPLY STATUS CODES... AT LEAST THE MOST IMPORTANT ONES!
I HEAR A RUMOR THAT AR 735-35 LISTS ADVICE, STATUS AND IDENTIFIER CODES!
CANCELLATIONS MUST BE PROMPT... AND FOLLOW-UP QUERIES SENT ONLY AFTER DATE SHOWN ON STATUS CARD ON REQUEST... OR ON CARDS RETURNED BY SUPPORT!
...YOU USE PLL STOCK TO FILL BIIL REQUESTS QUICKLY!
RECORD DEMAND AND RE-ORDER PLL REPLACEMENT, HUH?

YEP... AND YOU USE THE TM'S INTERCHANGEABILITY INFO TO PROVIDE NEEDED ITEMS FAST!
THEN, THERE'S RECONCILIATION INFO... LIKE KEEPING STATUS CARD FILES UP-TO-DATE SO AS TO GIVE SUPPORT FAST, ACCURATE REPORTS!
YOU KEEP YOUR CURRENT DX LIST HANDY AND MAKE SURE UNSERVICEABLE DX ITEMS ARE PROPERLY TAGGED WITH DA FORM 2402.
NOT TO MENTION FAST AND CAREFUL TURN-IN OF SAME!
CHIEU HOI STATION
OF COURSE, SHARP INVENTORY CONTROL MEANS MAKING A PHYSICAL CHECK OFTEN!
AS CALLED FOR BY AR 735-35 OR YOUR CO...
PUFF

FINALLY, PICKING UP SUPPLIES FAST FROM SUPPORT IS CRITICAL... PROTECTING THEM WHILE IN STOCK FROM RUST AND DAMAGE IS THE SUPPLY MAN'S RESPONSIBILITY!
ABOUT TIME... MY 105'S BEEN DOWN SINCE YESTERDAY FOR WANT OF ONE CRUMMY PART!
MAINT SHOP
C'MON, MAN, LET'S JACK IT UP!! WHERE YOU GUYS BEEN ALL DAY?
GETTIN' SUPPLIES... WHICH, INCIDENTALLY, YOU SHOULD HAVE ASKED FOR 3 DAYS AGO.
PUF
PUF
REPAIR-PARTS SUPPLY
Y'SEE, EVERYONE IS INVOLVED IN SUPPLY DISCIPLINE!
THE USER WHO MAKES THE REQUEST PROMPTLY... THE SUPPLY MAN WHO KNOWS THE PROPER FORMS AND HIS SUPPLY SOP... AND THE COMMANDER WHO SEES THAT PROCEDURES ARE FOLLOWED!... IT TAKES EVERY-ONE TO MAKE IT WORK!

AIR MOBILITY

"CHOOSE YOUR PIN, PARDNER"



You Chinook (CH-47) tenders, better check the engine mounts for security — and focus on the aft mount.

Make sure the quick release pin used to attach the engine support link to the mount is a single-acting type . . . one of the good guys. It has a handle.

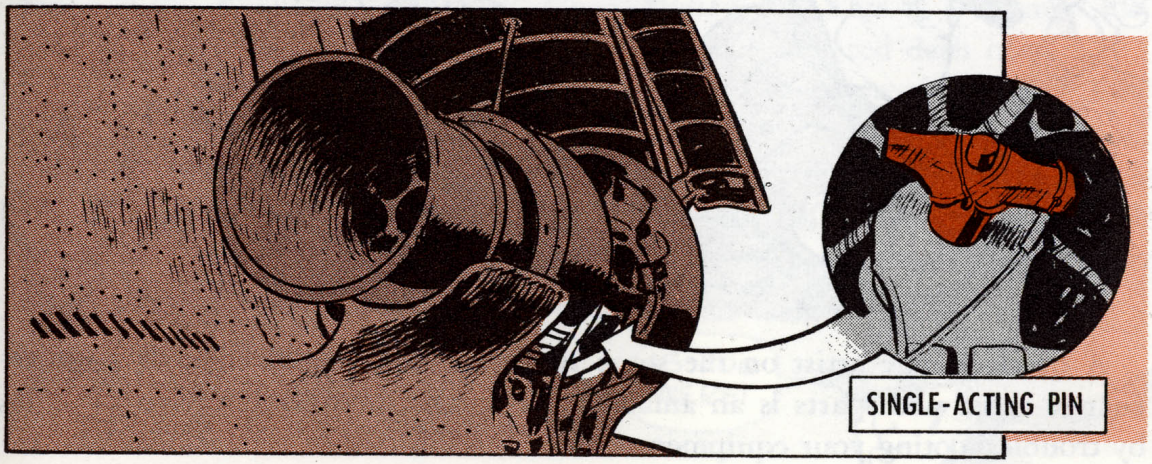
A double-acting pin is something else again . . . one of the bad guys. It has a pull ring in place of a handle.

Trouble is, a pull on the ring to check pin security can upset the apple cart!! The pin moves enough to allow the locking balls to enter the hole — the pin binds and feels tight.

During flight the pin works loose and your engine will be held by 2 mounts instead of 3. 'Taint a healthy situation.

Nosir-e-e-e, you don't want double-acting pin, FSN 5340-226-4961, fig 64, item 6 of TM 55-1520-209-20P-1 (18 Mar 68).

Make sure your engine is anchored with a single-acting pin . . . one of the good guys. Order the right pin, P/N NAS1338A2C20, FSN 5340-921-0666, listed on page 665 of the parts pub.



SAVES ELBOW GREASE

Dear Editor,

Know how tough it is to shoot grease into some push-pull rod-end bearings on a chopper? Plenty!

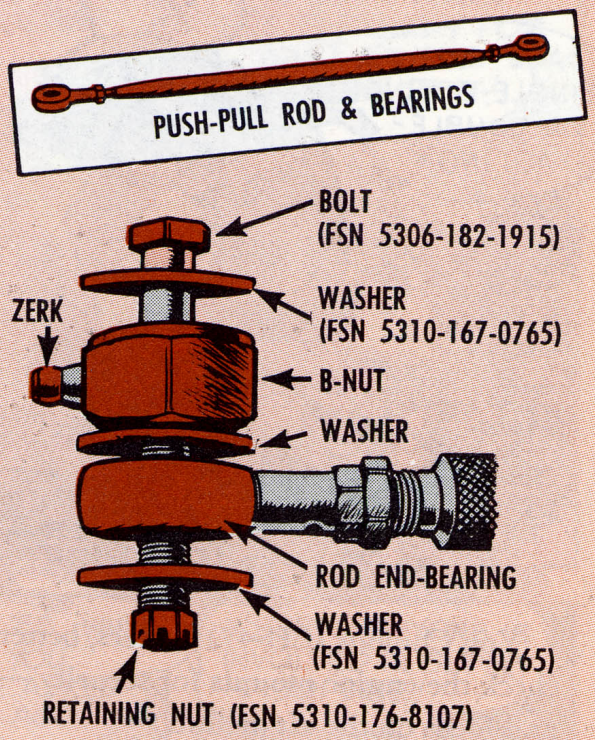
You can't fit the standard bearing lubricator into place, so, the rod has to be taken off the bird to get at the bearings.

To save time and elbow grease we now just disconnect the rod and grease one bearing at a time—using a locally made lubricator.

To make this little jewel just drill a hole in the B-nut, thread the hole and insert a suitable zerk fitting. Add the necessary hardware.

It's simple to use the tool. Put one washer on the bolt and add the B-nut. Add a second flat washer with the ID longer than the OD of the bearing inner race and the OD long enough to rest on the outer edge of the bearing.

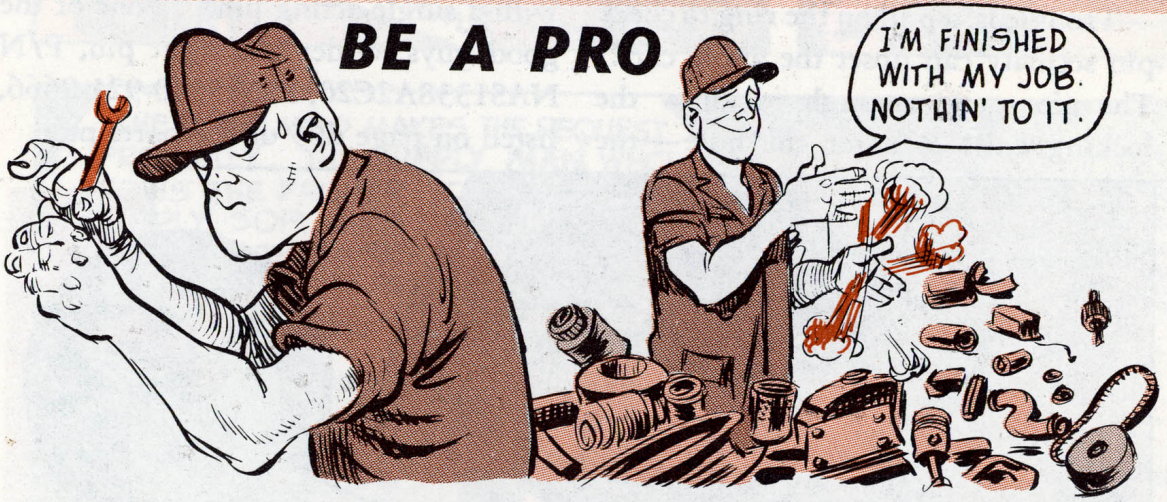
Insert third washer and retaining nut, finger tight.



Make with the grease gun and you've got those bearings greased, easy as you please.

Otto T. Trapp
Fort Douglas, Utah

(Ed Note—Looks like a real handy tool for tight places.)



A quick-change artist on the stage is a pro. A mechanic who is a quick-change artist with parts is an amateur. Be a repairman, not a parts changer, by troubleshooting your equipment.

"SOCK IT TO ME"

Kicking a bird tire on an inspection won't prove anything. But a rap on the MA-1 shoulder harness locking reel, P/N 21-0121-23-440, will.

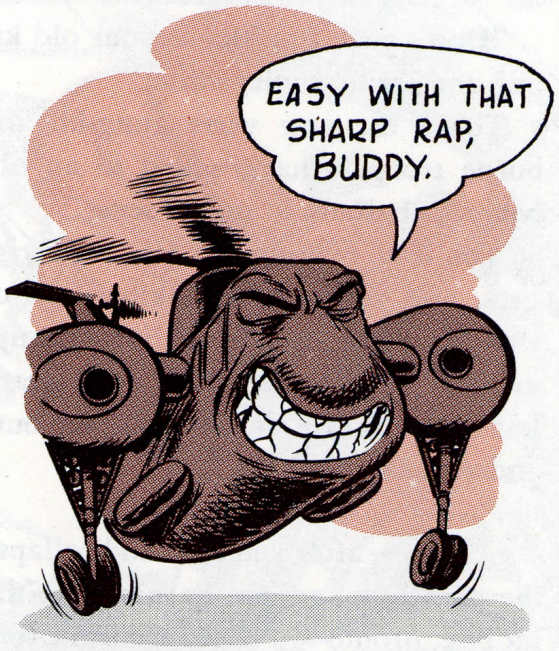
The reel is in the Mojave (CH-37B) for one. It may also be supplied as a repair part for your bird.

You can yank on the payout cable 'til kingdom come to check the automatic locking feature of the reel, and it won't lock.

The whole assembly has to be accelerated 2-3 "G's" for the spring-loaded locking mechanism to work.

What to do? Well, reels are mounted on surfaces that will yield slightly under "G" forces.

So, with the harness locking lever in automatic, give the reel a sharp rap with the palm of the hand. Then pull on the cable and you'll find that it's locked.



To unlock the reel move the harness lever forward to the lock position and then back to the autolock position.

There's no problem checking the automatic locking feature of the MA-2 type reel, used on most birds. A sharp pull on the cable will do the trick.

TBO VARIATION

Dear Windy,

How about a reading on extending the operating life of a time change item in accordance with the info in para 5b of TB 55-1500-300-25 (Mar 67) on component replacement?

Para 5c says that unit commanders can extend the operating time on components, only under emergency conditions of combat or disaster. It also calls for a red dash entry in the DA Form 2408-13.

When we extend a UH-19 engine change so that it falls on a Periodic are we acting under emergency conditions?

SP6 C. E. M.

Dear Specialist C. E. M.,

Nosir-e-e-e! This is a normal TBO variation — no red dash needed.

Normal variation of an engine TBO, per para 5b, is encouraged to get full use out of the engine. It also avoids the use of extra NORM time which would be needed on an engine change between Periodics.

AFTER A NYLON LETDOWN . . .

A LITTLE POST-

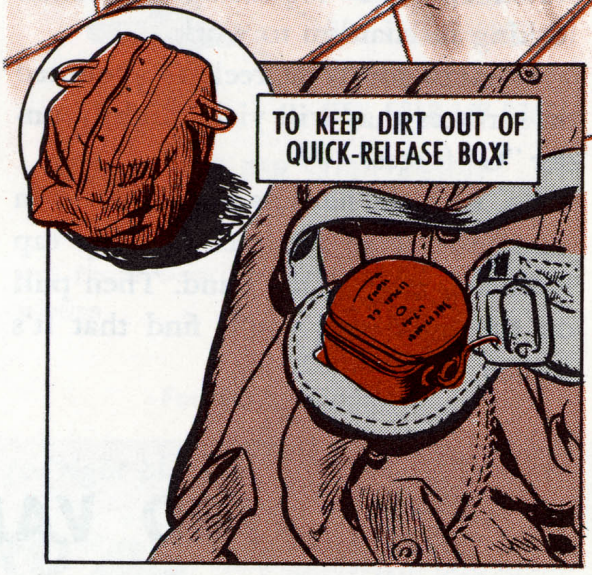
"Don't pack troubles in your old kit bag and smile, smile, smile!"

That's the new verse gung-ho airborne troopers have added to an old barracks ballad . . . makes sense.

You'll be helping the MOS 43E riggers, and yourself, by taking care of your parachutes and air delivery equipment. A little tender lovin' care means less maintenance sweat on shake-outs and repairs.

BAG IT!

Like — after you land and collapse the parachute, get the harness into the kit bag, pronto . . . if the tactical situation will let you. Never drag the harness along the ground because the quick-release box, for example, is a mite delicate and can get jammed with dirt.

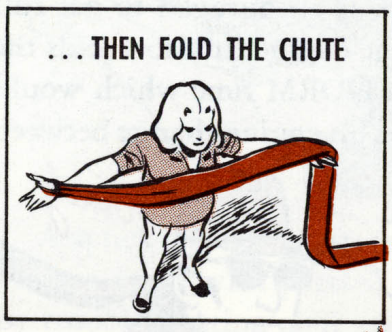


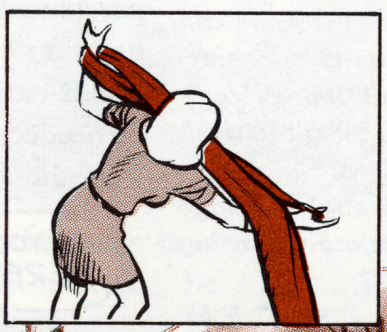
Keep the bellyband hanging out of the bag so you can secure the chute.

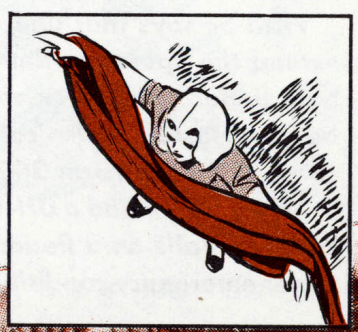
Go to the chute apex and grab the bridal loop. Gently pull the chute to straighten the canopy and suspension lines. Be sure you don't drag the canopy over stumps or thru the dirt or you're likely to tear some of the gore sections.

Fold the sides of the canopy into a width of about 2 feet.

Go back to the apex and latch onto the bridal loop with your thumb. Stretch out your arms and make like a soaring bird as you gather in the canopy and suspension lines in a figure-8 motion.







AFTER A NYLON LETDOWN . . .

A LITTLE POST-FLIGHT PM

"Don't pack troubles in your old kit bag and smile, smile, smile!"

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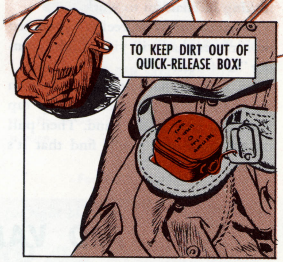


Keep the bellyband hanging out of the bag so you can secure the chute.

Go to the chute apex and grab the bridal loop. Gently pull the chute to straighten the canopy and suspension lines. Be sure you don't drag the canopy over stumps or thru the dirt or you're likely to tear some of the gore sections.

Fold the sides of the canopy into a width of about 2 feet.

Go back to the apex and latch onto the bridal loop with your thumb. Stretch out your arms and make like a soaring bird as you gather in the canopy and suspension lines in a figure-8 motion.

Never twist the canopy more than necessary because friction can cause the nylon to fuse.

PS MORE

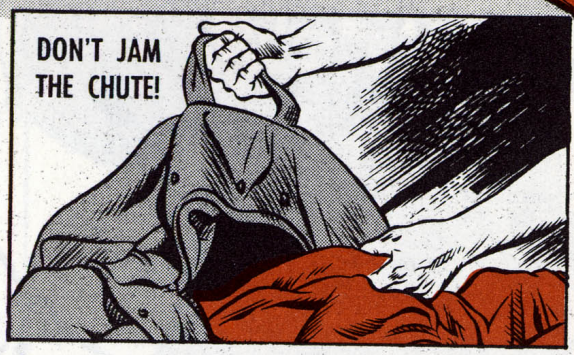
FLIGHT PM
Never twist the canopy more than necessary because friction can cause the nylon to fuse.
PS MORE

Lay the chute on top of the harness and secure the chute with the waistband. Make sure you don't pull any of the canopy thru the waistband adjuster because you may tear the canopy or wind up with friction burns.

Put the reserve chute on top of the main canopy. Fasten the kit bag and you've got it made in the shade.

Recovery of cargo chutes is something else again — more material to get torn up and longer suspension lines to get twisted . . . unless you use TLC.

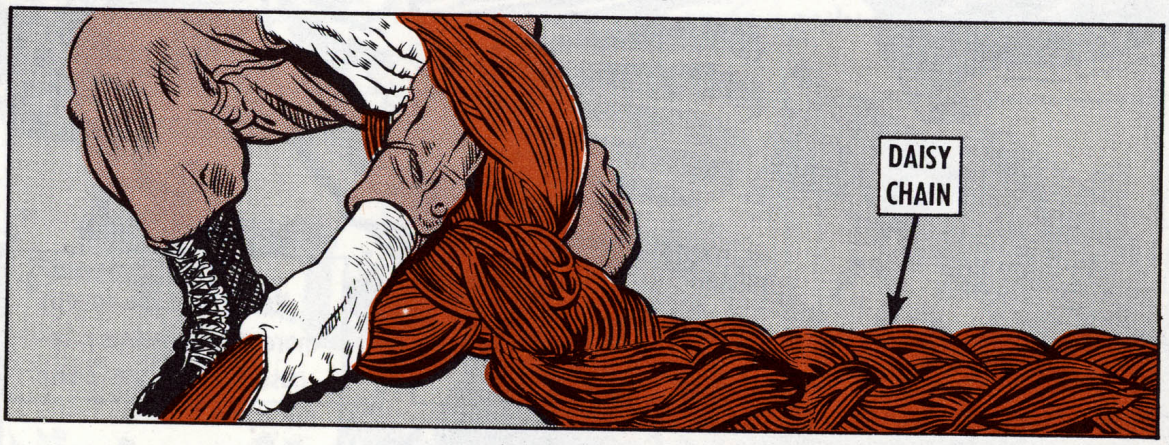
Whatever you do, never jam the chute into the recovery bag in a bundle or it'll take all day for the riggers to figure out which end's up??



Stretch out both the canopy and suspension lines by lifting, not dragging. This will help keep sand, dirt and debris out of the canopy.

Take off the riser extensions and ground releases. Put the clevis bolts into the clevises from which they were removed. Lock the nuts back in place on the clevis bolts.

Next, daisy-chain the suspension lines. This will prevent tangles in those long lines.



"S" fold the canopy into the deployment bag. Fold the suspension lines and risers on top of the canopy.

When you're recovering small cargo chutes, like the G-13, put the suspension lines inside the deployment bag first. Then lift the folded canopy into the bag.

Tie the bag shut with any cord on hand (don't cut suspension lines, and your chute is ready to make the trip to the tower for shakeout and repacking.

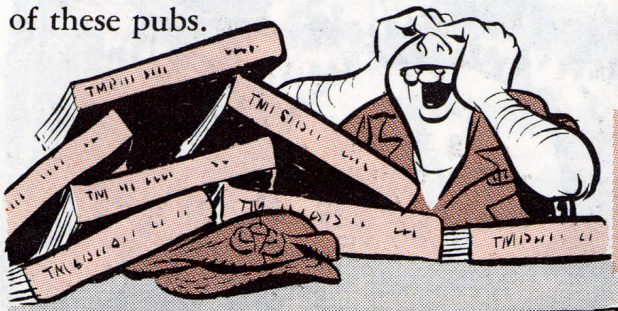
ABOVE ALL—CLEAN!

When transporting your chute to the flight line or from the drop zone, think "clean". The kit bag is not water-proof or oil-proof.

Never pile the chutes into a truck that just carried fuel or oil drums, grease, batteries and the like. That stuff will eat into the kit bag and into the chute.

Use a covered truck and if the floor is a mite dirty, spread down a tarp to protect your equipment. That's TLC in action.

If you're the type who likes to do a little homework park your cap at the tech library and cuddle up with some of these pubs.



TM 57-220 (4 Jun 68) Technical training of parachutists.

TM 10-1670-213-23 (2 Sep 63) Parachute, personnel, troop-back 35-ft dia nylon canopy, type T-10.

TM 10-1670-214-23 (17 Jun 66) Parachute, reserve, personnel, troop chest 24-ft dia, nylon canopy, type T-7A, T-10.

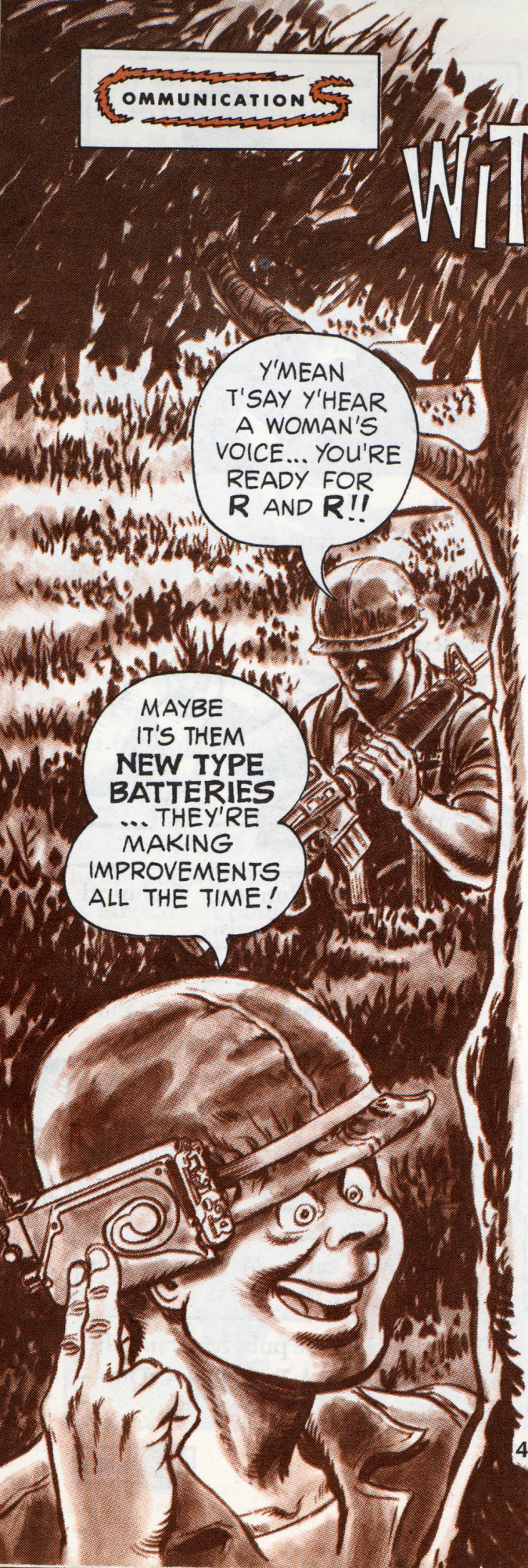
TM 10-1670-223-23 (23 Mar 64) Parachute, cargo 24.25-ft dia canopy, type G-13.

You'll find all the pubs for your other chutes listed in DA Pam 310-4. Dig—dig—dig, Tiger!

PS END

COMMUNICATIONS

WITH TLC



A long-range tough guy it ain't. It wasn't made to be. Thin skin it has . . . so it won't pull you off balance when it's in your pocket . . . or feel like a rock when it's dangling from your helmet.

It's got faults, sure, but your li'l ol' squad radio (AN/PRT-4 and AN/PRR-9) is undergoing a constant face-lift that'll let it do a better job for you.

Range will still be 1600 yards or less under good conditions and down to 150-200 yards in thick brush . . . but then, just how far you gonna get from your squad leader, man? Or how far's he gonna get from you?

That lightweight job isn't supposed to get out there like the bigger stuff. And, er, how'd you like to dangle an AN/PRC-25 from your helmet whilst you're waiting word from your squad leader . . . or share your back with squad leader gear, rifle, combat pack and Perk-25? Like, give it the TLC it deserves. T'weren't built for sledge-hammer treatment.

Even so, there're recent and upcoming improvements that'll cheer your heart—things like better batteries, with longer life; better moisture-proofing, sturdier antennas, and so forth.

IT'S LEAN, LIGHT & SHORT ON MIGHT, BUT...

WITH TLC IT'LL DO RIGHT

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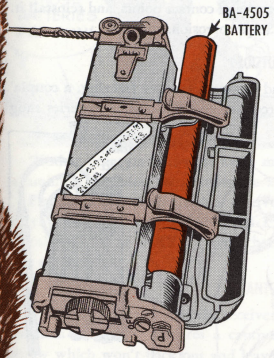
BATTERIES

Available right now is an aluminum shelled, magnesium battery, the BA-4505/U, that'll almost triple the life of the original BA-505/U (up to 40 hours continuous service). You get the magnesium job with FSN 6135-935-8630.



Some other advantages: The BA-4505 has longer shelf life, needs no refrigeration during shipment and storage . . . and fares better in SEA.

PS MORE

ON MIGHT, BUT . . .

IT'LL DO RIGHT

BATTERIES

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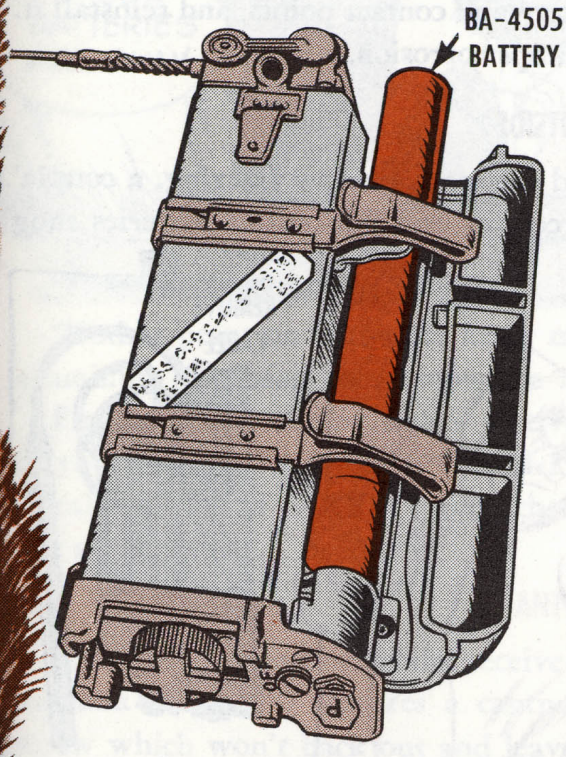


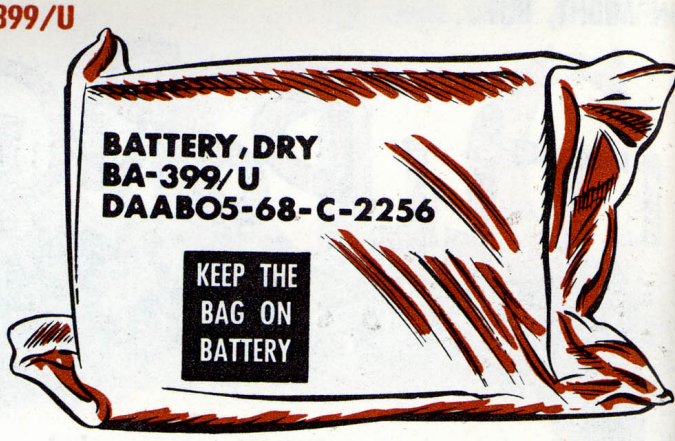
Some other advantages: The BA-4505 has longer shelf life, needs no refrigeration during shipment and storage . . . and fares better in SEA.

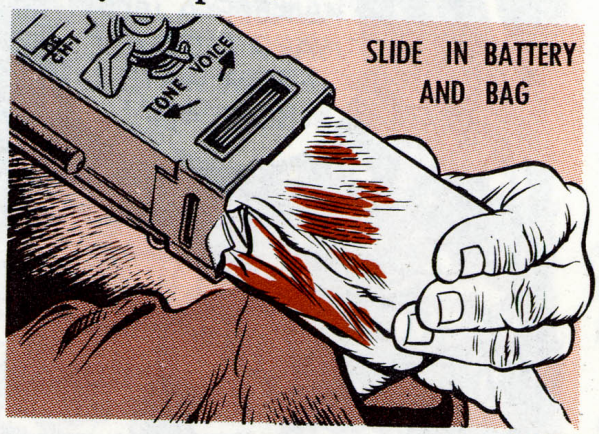
BA-399/U

The BA-399 transmitter battery also is improved . . . which you may've learned by now. Because of moisture problems, each battery comes sealed in a plastic bag.

Keep it in said bag!

Insert battery, bag and all, onto the male plug of the transmitter. Puncture the plastic with the pins and slide the battery into place.



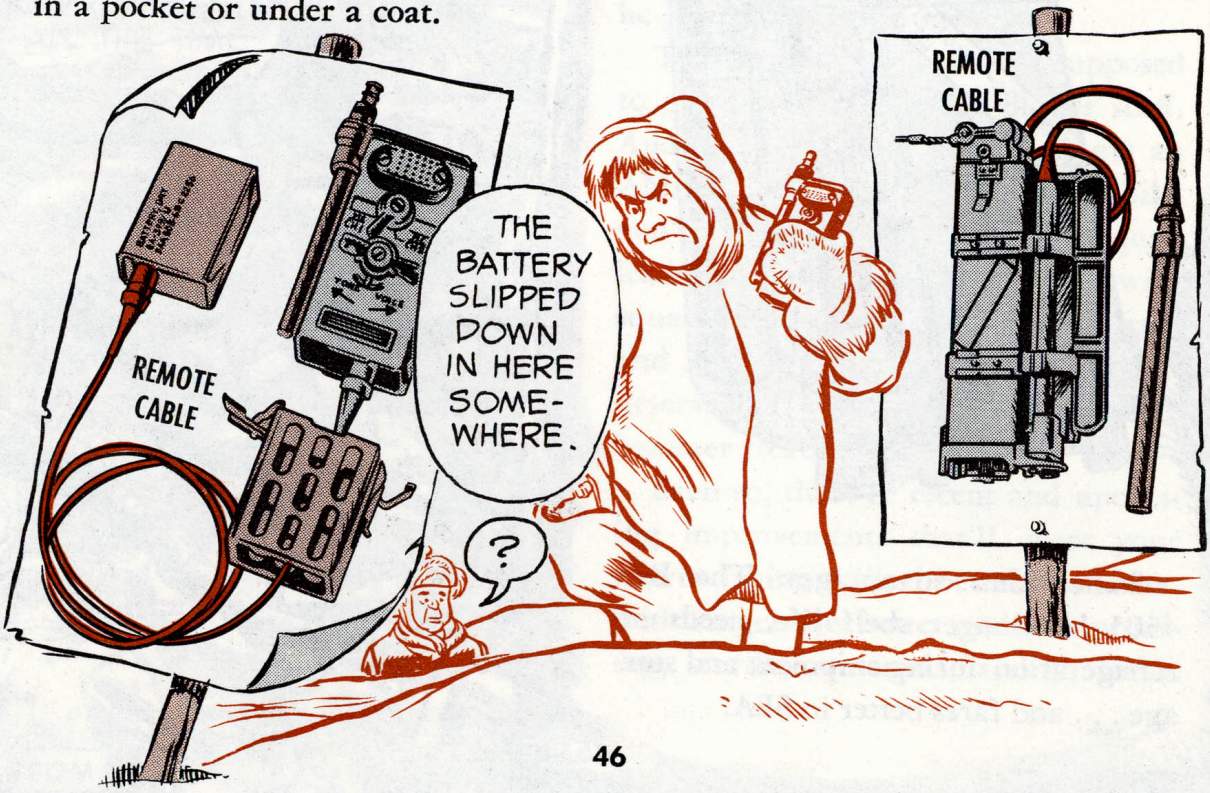


It may not be the total answer to waterproofing, but it's a better deal than the BA-399 without a bag around it!

After salt water wading remove the transmitter battery (receiver power pack, too, if you splash it), dry the battery and contact points, and reinstall it. Stops corrosion.

COLD OUTSIDE

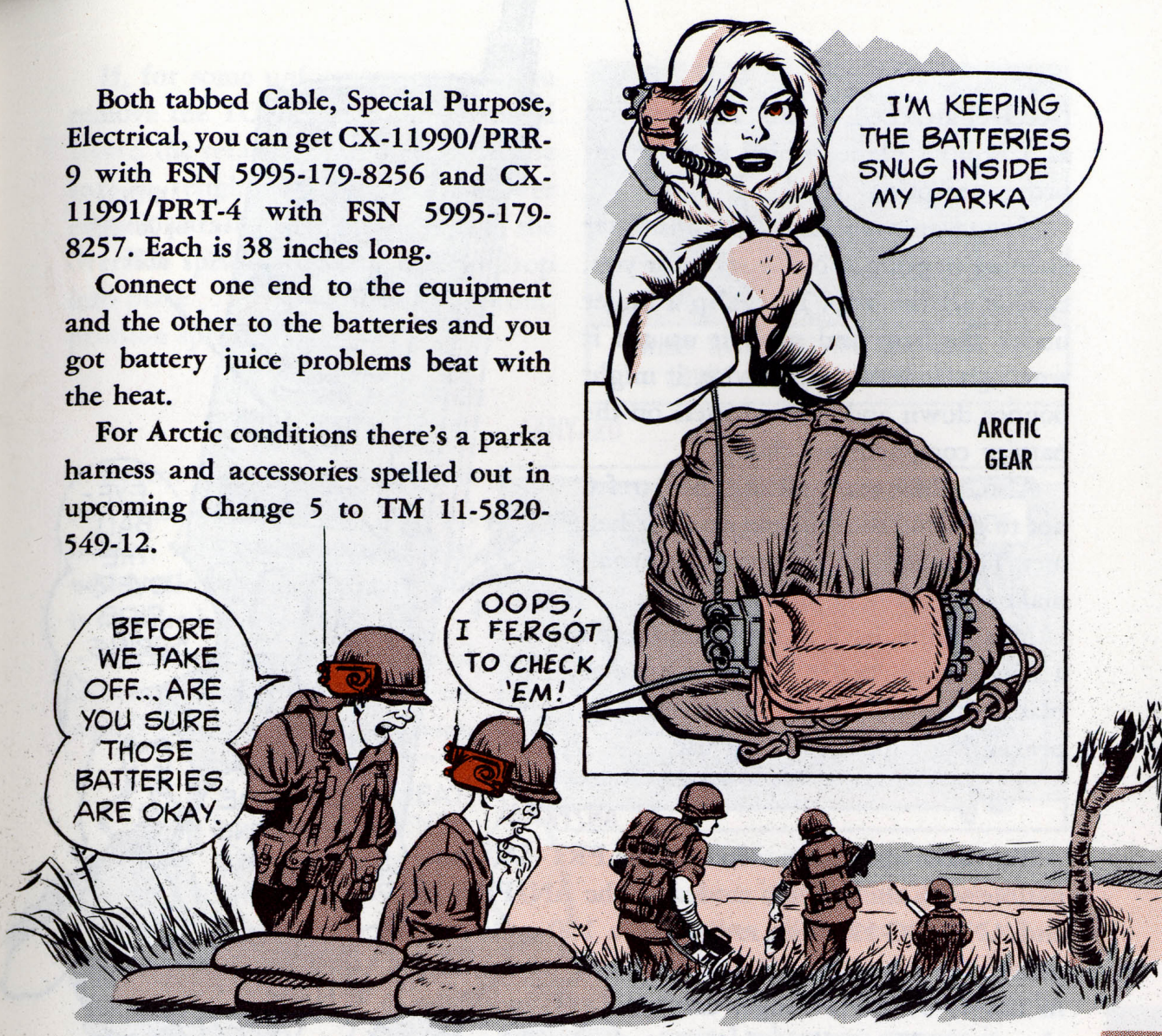
If you don't have Arctic accessories and the temp's below freezing, a coupla' new remote cables will let you keep the receiver and transmitter batteries snug in a pocket or under a coat.



Both tabbed Cable, Special Purpose, Electrical, you can get CX-11990/PRR-9 with FSN 5995-179-8256 and CX-11991/PRT-4 with FSN 5995-179-8257. Each is 38 inches long.

Connect one end to the equipment and the other to the batteries and you got battery juice problems beat with the heat.

For Arctic conditions there's a parka harness and accessories spelled out in upcoming Change 5 to TM 11-5820-549-12.



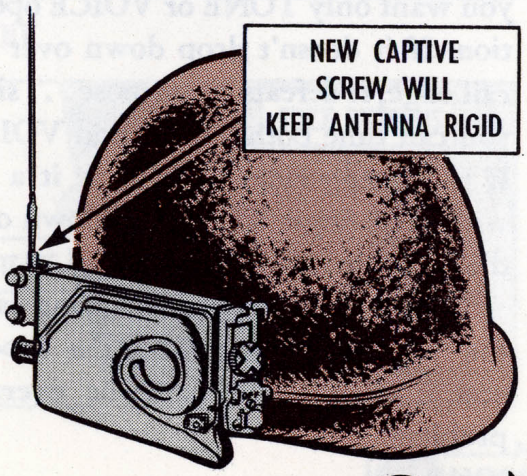
'Nother point on batteries: Later model BA-505/U's and all BA-4505's have aluminum cases for better moisture and damage protection.

Finally, when alining either receiver or transmitter, check the voltage range of your batteries with the AN/PSM-13 or ID-1189/PR test sets. Be sure you get a scale reading of GOOD . . . and check your spare batteries, too, before going out on a mission.

ANTENNAS

The latest production model receiver antenna (AS-1998) features a captive screw which won't back out and leave you with a wobbly "stick."

The screw will help keep the antenna pointing at the sky, where you get maximum range. The best way to wave the antenna around is on your helmet



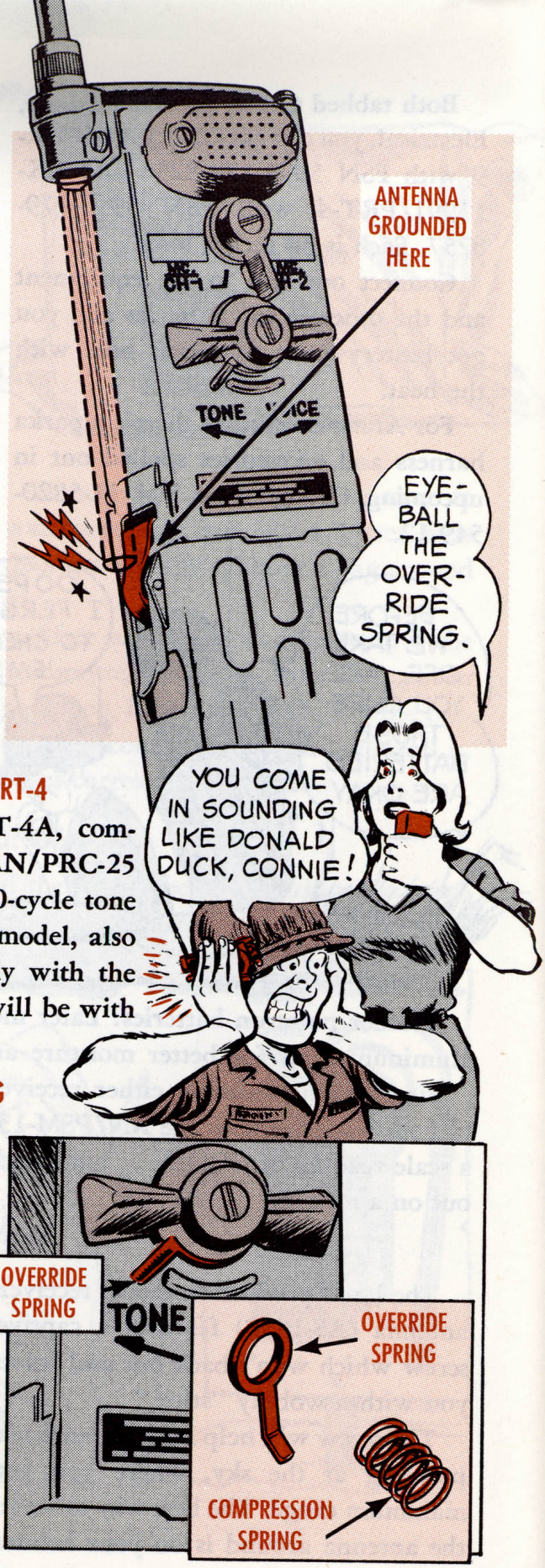
PS MORE

(receiver attached, natch). The steel acts as a ground plane, which in turn improves reception.

If you want your AS-1999 transmitter antenna to put out No. 1 style for you, raise it all the way. Like, slip a finger under the base and push it up till it won't go no more. Otherwise, it might bounce down and ground itself on the battery compartment clamp.

Also, while transmitting, be careful not to ground the antenna on your helmet. The word you're putting out won't make it to the next bush.

Meanwhile, back at the farm, there's a new model AS-1999 that snaps into place when you pull up the antenna . . . preventing slippage during use.



AN/PRT-4

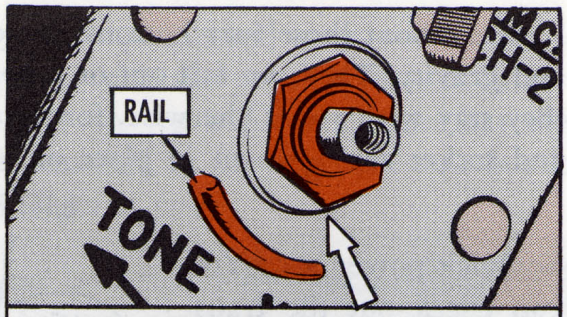
To make the latest Model, the PRT-4A, compatible with the squelch modes on the AN/PRC-25 and AN/VRC-12 series radio sets, a 150-cycle tone generator was added. That way, the A model, also in the 47-57 MHz range, can net freely with the above sets. Naturally, primary netting will be with the PRC-25.

OVERRIDE SPRING

Eyeball the override spring next time you want only TONE or VOICE operation. If it doesn't drop down over the rail edge, it defeats its purpose . . . since you can tune both TONE and VOICE. If the spring rides high, give it a tap with your finger so it'll slip down over the right or left side of the rail.

A heavier compression spring is on the way in later production models and it should eliminate the override problem.

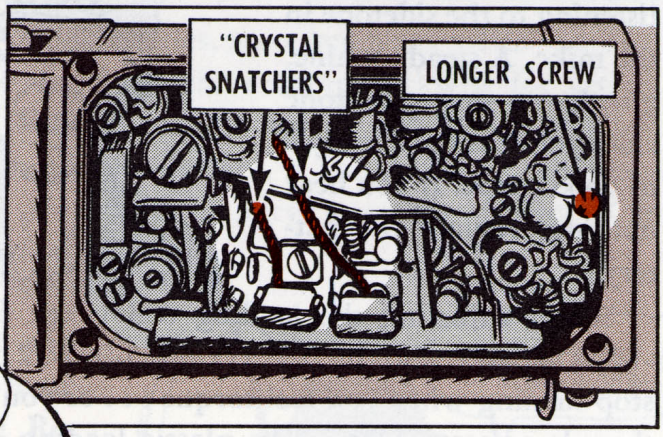
If, for some unforeseen reason, you remove the TONE/VOICE switch and loosen the retaining nut on the case, be sure to retighten the nut so its lower edge is parallel to the rail. If not, the override spring won't be able to drop into place . . . even with a heavier compression spring.

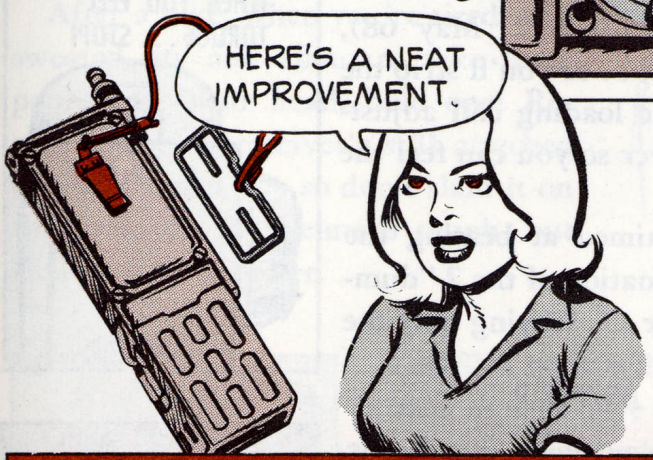


LANYARD

Recent production transmitters feature a remodeled lanyard holder, with eyehole and a snap which allows you to freely attach it to your harness slide.

There're 2 handy little crystal snatchers in your transmitter which make the job of removing





'em 'bout a 1000 percent easier. Be sure to slip those nylon cords between the contact pins when you install your crystals. Forget the cords and you'll damage the crystal when you remove it.

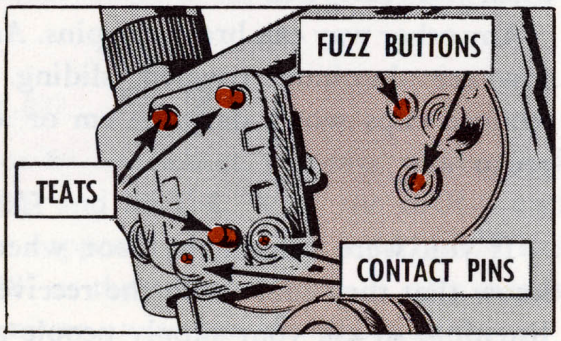
And since we're here, same deal goes for the receiver crystal.

If, for any reason, you must remove the module from the PRT-4, reinsert the longer screw in the top hole. The smaller one won't secure the module if you slip it in the top.

MIKE ELEMENT

Coupla' precautions are necessary when you remove the microphone element for cleaning:

First, be sure the rubber teats on the top and bottom of the element stay with it. Break 'em off or lose 'em and the mike contact pins won't make good contact with the fuzz buttons on the chassis.

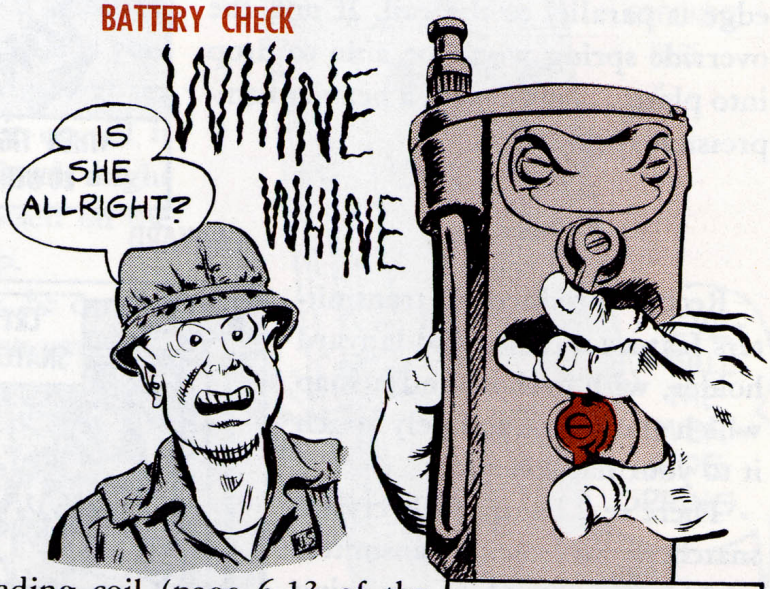


P.S MORE

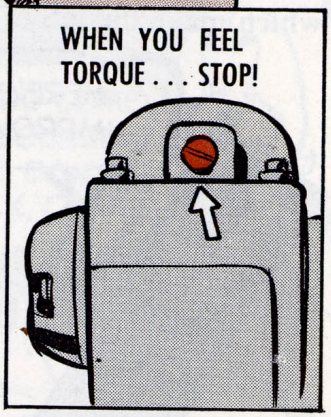
And, about those fuzz buttons, the only thing holding 'em in place is friction and gravity. They can fall out or otherwise get lost during cleaning, so be sure they stay with you. Otherwise, forget about transmitting. A conventional plug and socket arrangement in place of fuzz buttons is being put in the PRT-4A.

BATTERY CHECK

Quick power test: You can check out the transmitter battery by holding the TONE/VOICE switch in the TONE position and listening to the sidetone in the mike. A steady whine, gurgle or unsteady tone clues you that the battery's in good shape. If you hear nothing, replace the battery.



When adjusting the loading coil (page 6-13 of the -12 TM and also in TM 11-6625-937-12, May 68), stop turning when you feel torque . . . or you'll strip the threads or screw slot in the plastic loading coil adjustment screw. Use a small screwdriver so you can feel the resistance.

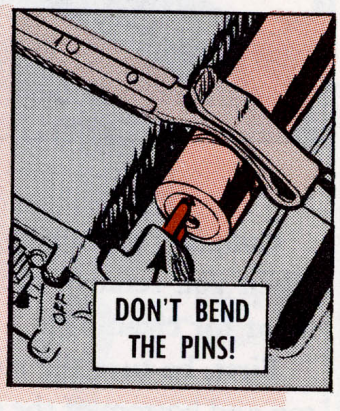


Coming up: a design change aimed at beating the frequency drift problem, and elimination of the 2 "dummy" battery pins on the transmitter . . . leaving only the 2 that do the work.

AN/PRR-9

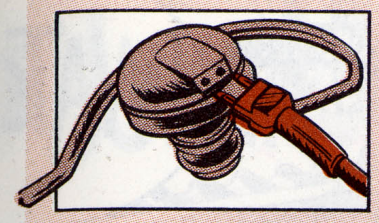
Keep straight . . . when you remove or install the receiver battery. When you install the battery, ease it in place in a straight line, then give it a gentle shove until the contact pins are fully engaged. Back it straight out when you remove it.

Any other way can break the pins. And, since batteries now are aluminum covered, sliding 'em through the retainer clips won't damage 'em or allow moisture to get to 'em.



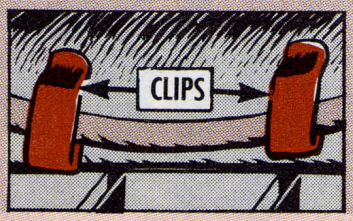
EARPHONES

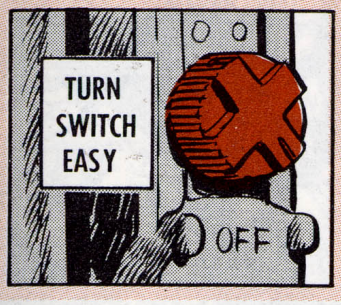
If you were behind the door when earphones were passed out, you should know that they come with the receiver. They come in mighty handy for quiet listening, so ask your supply people about 'em.



When you get your earphone, and use it, an occasional check on the connector cable can pay dividends in listening pleasure. Snug it up. An improved model has the cable permanently attached to the earphone . . . but it may take a while to get to you.

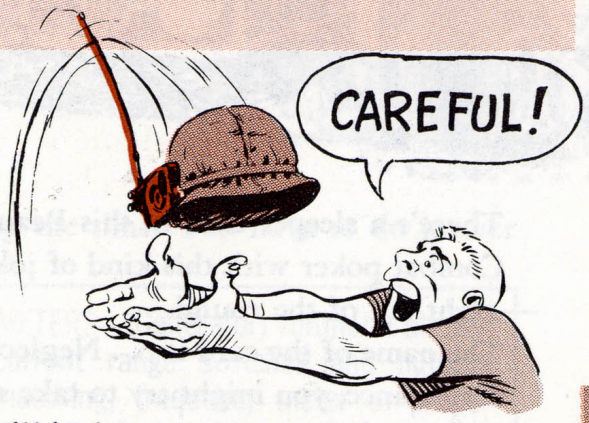
As you attach the receiver to your helmet have mercy on the spring clips. They go over the steel helmet only — not the helmet and liner. Forcing the clips over both can break 'em or spring 'em so much they're useless.

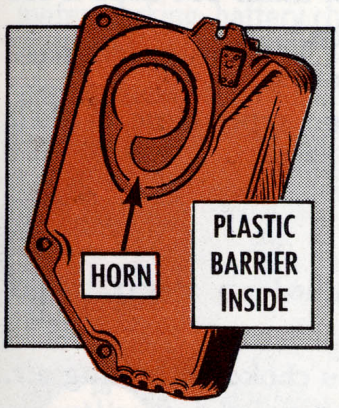




Talking about muscles, leave 'em home when you turn the volume-on-off switch. Turn it clockwise for action, but don't force it—you'll bust it up! When you feel resistance, stop! Chances are, if you don't get any noise you're due for a new battery . . . or the control is in squelch setting.

After a hike, when you're tired, and sweated up, and about to take some pounds off your head, hold one! Remember, your receiver's still attached to your helmet . . . so don't slam it on the ground. The helmet's tough, but that little ol' receiver. . . .





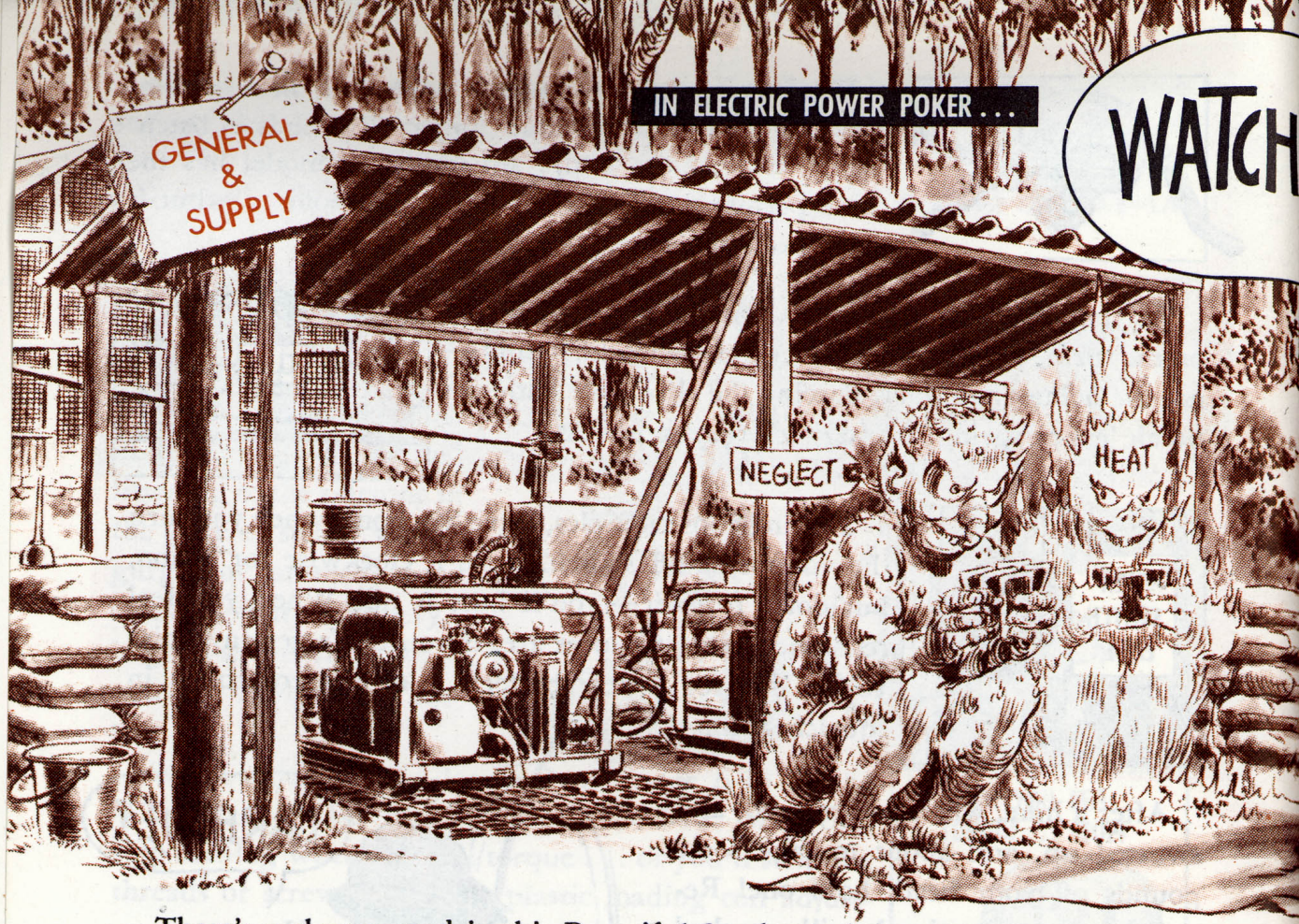
You SEA types will be happy to learn that recent production models have a plastic barrier in the horn which stops mud, sand and water 'bout half way up. It keeps the gook from getting in deep and putting your receiver out of business.

If you're tramping thru that kind of stuff, give the receiver an occasional shake to let the gook come tumbling out.

AN/PRC-88? ??

Somewhere along the trail, by school or by scuttlebutt, you may've heard of the "AN/PRC-88," a "combined" PRR-9 and PRT-4. Well, the PRR-9 and PRT-4 are as combined as they are ever supposed to get, but USAECOM has taken action to standardize "AN/PRC-88" as the nomenclature . . . as a means of identifying the receiver and the transmitter under one identification.

PS END



There's a sleeper card in this Beautiful Southeast Asia generator game.

Combat poker with this kind of joker could take you — and your whole outfit — right out of the round.

The name of the card is . . . Neglect.

F'rinstance, you might try to take shortcuts. You might think TM dope is for brick-barracks types across the Big Pond, not fightin' men.

The real deal is, you have to do more, not less, to win out here.

So cut the deck before you bet your life. Four-Season types close to their FIGMO day will tell you there's two things to look out for:

Heat is one.

Dirt is the other.

They're both mean. And when you think you've studied up a way to get around one, the other clobbers you from behind.

Revette and roof in to keep out blowing sand, and you choke off cooling air. Stay wide open for breeze, and you get sandblasted.

But you can protect your ante. There are ways.

THOSE VITAL CHECKS

Just one man in your outfit can do much to keep power up. That's you, the generator operator. You can hack it just one way —

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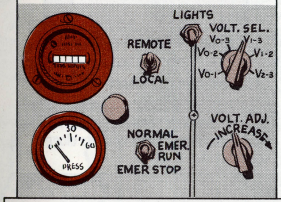
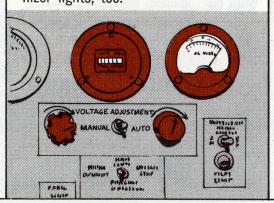
That's by checking, watching, and taking the time. You have to do it over and over. So look after —

METERS — (Engine) Oil Pressure 25 PSI minimum even in hottest weather; hour-meter working; battery charge indicator on input; coolant 200°F or below; cover glasses sound and clean, needles OK.



METERS—(Generator) Voltmeter steady; current range switches and outputs matching; frequency meter in proper range; cases, glasses, and needles sound. In parallel, watch the synchronizer lights, too.



SWITCHES — Emergency Stop-Run on **Normal**; breakers and rheostats right for load; phase selector matching use; panel light working (off if not needed); cover over power takeoff closed.

MORE

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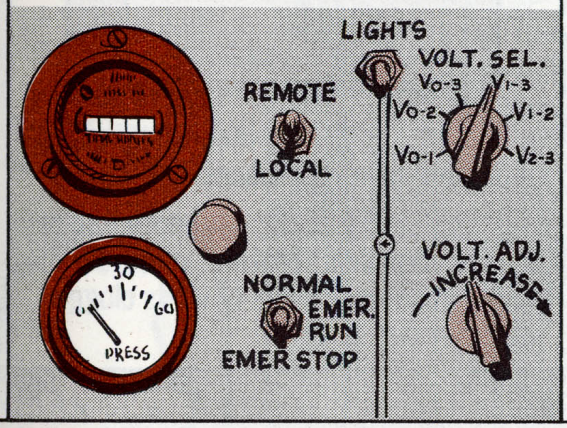

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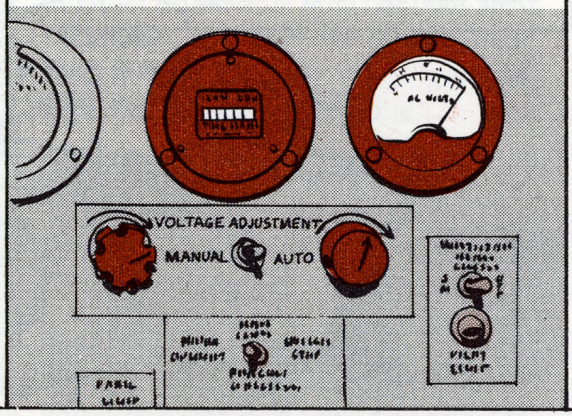

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PS MORE

Sounds simple . . . is simple. But meters, lights, and switches will do you no good unless you use the eyeball. They're there to tell you if the coast is clear or warn you of trouble. Fail to watch 'em, and you throw away your protection.

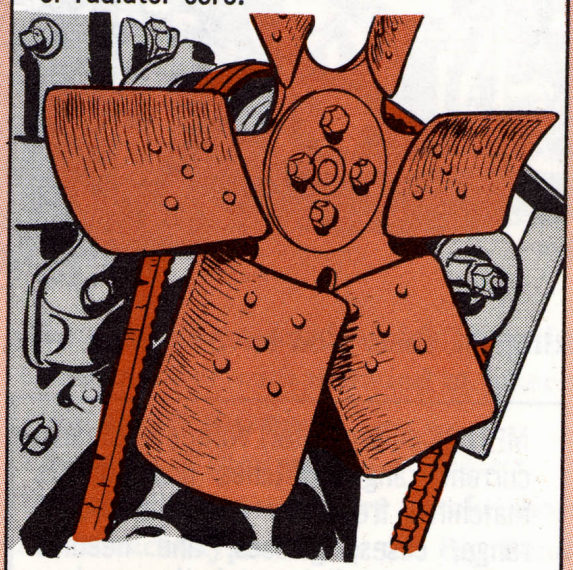
The main thing—you've got to **be there** to check.

Then when you do find something off-beat, you'll know where to start looking. Those instruments are like signboards—and you can believe 'em.

SCAN THE KICKER

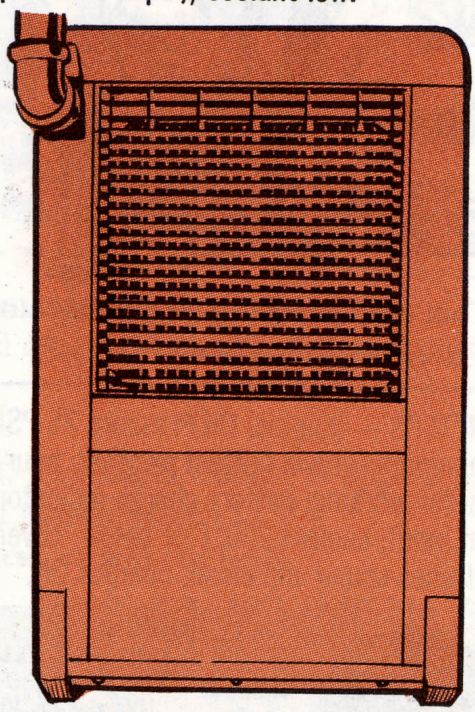
Usually, the engine end gets hit by heat first and worst. Here's some quick-look possibilities:

FAN—Belt loose, frayed; shaft or bearing worn, unlubed; blades hitting guard or radiator core.



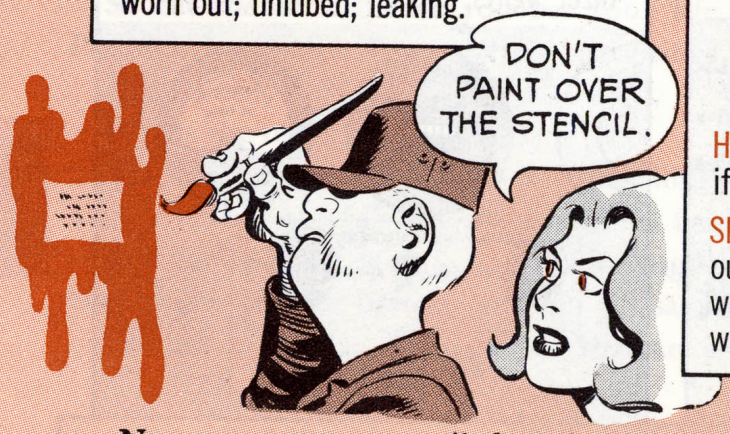
WATER PUMP—Broken, stuck, shaft worn out; unlubed; leaking.

RADIATOR—Fins clogged with mud, sand, trash; joints or hoses leaking; cap loose (Watch it! No yanking off those pressure caps!); coolant low.



HOOD AND COVERS—Keep snug, mend if broken, take no chances.

SHUTTERS, COWLINGS—Loose, bolts out or brackets broken; closures in wrong position; louvers or vents clogged with oily dirt or trash.



New sets now get stenciled on their sides to show whether you keep the panels open or shut to run—and when. You do **not** paint over that stencil. Anyhoo, if you spot a temperature jump and don't find it in your cooling system itself, try—

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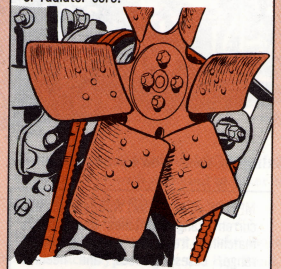

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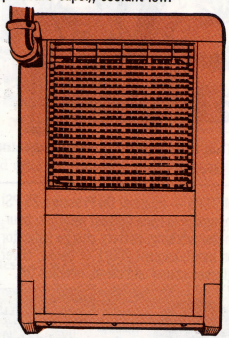

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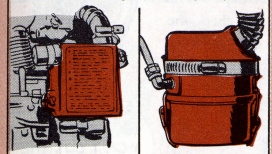
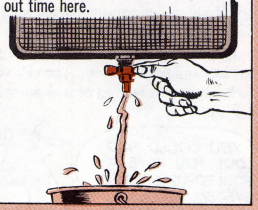
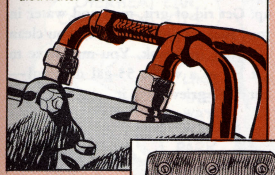
AIR FILTER—Real dirty weather can load dry-core units down in 2 hours; grit on the bottom of an oil-bath cleaner means clean out . . . and any bum air filter can make you run hot, hot, hot.



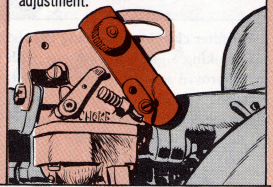
RADIATOR DRAIN COCK—Turn it: If it won't drip 'till you poke the hole or comes out thick and muddy, it's clean-out time here.



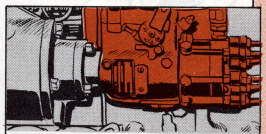
IGNITION—Plugs dirty, carboned, burned; spark linkage binding, spring weak; cables burned; water in cover caps or outlets; cracked magneto or distributor cover.



CARBURETOR—Governor linkage sticking, loose; air intake choked; out of adjustment.



FUEL STRAINER/FILTER—Check filter screen carefully for thin layer of fungus, especially if any traces of water show in either strainer or filter. Get out sand, rock chips, and look for signs of mud. Mud in this end may mean your fuel intake is blocked at the tank.



FUEL INJECTOR—Look for a cracked inlet collar, caused by over-torquing fuel supply line.

PS MORE

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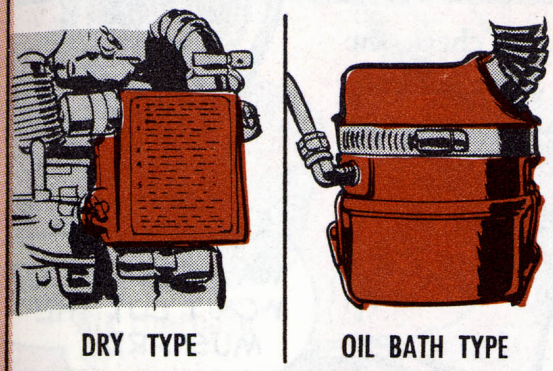

DRY TYPE

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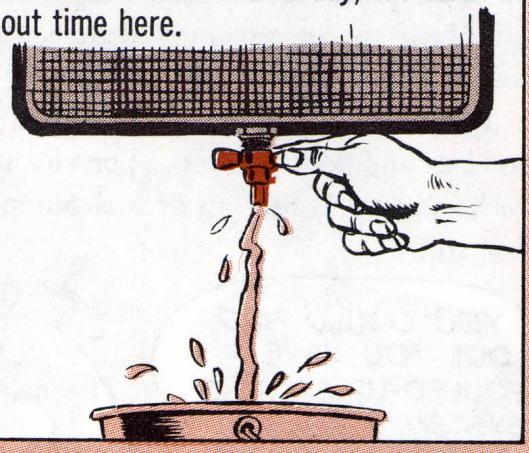

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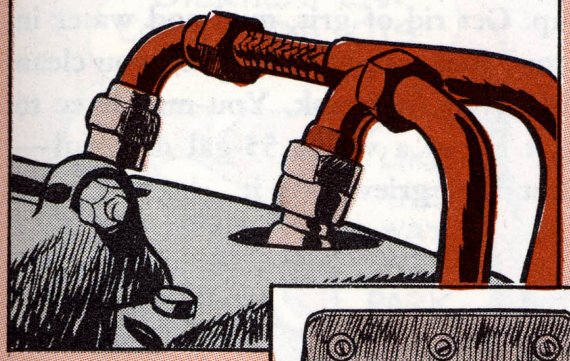
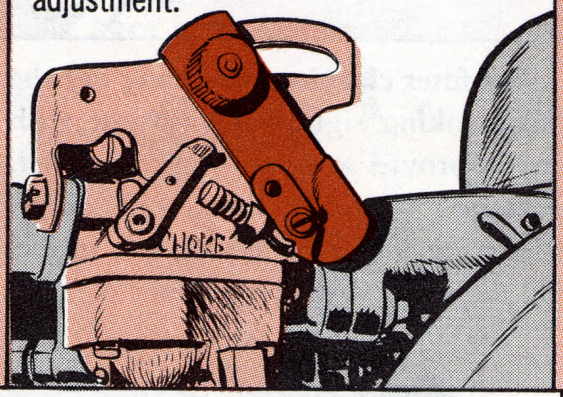
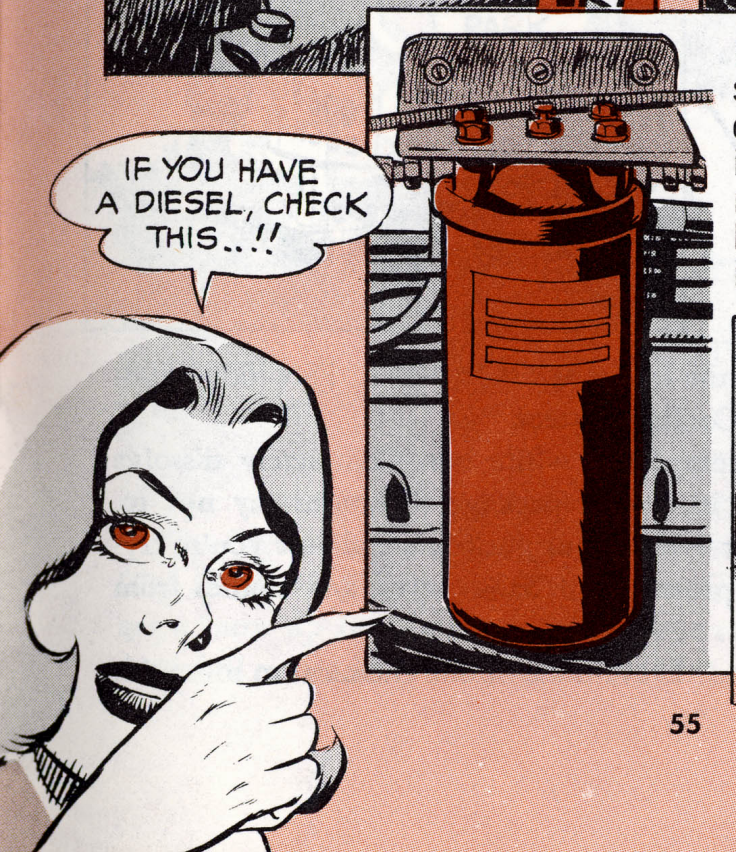
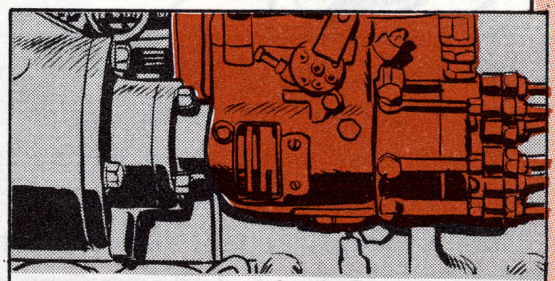


CARBURETOR—Governor linkage sticking, loose; air intake choked; out of adjustment.





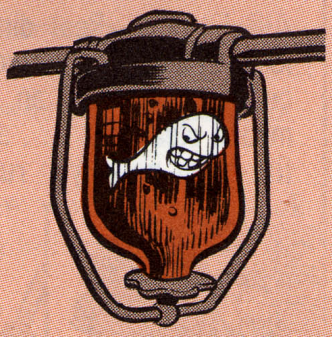
FUEL STRAINER/FILTER—Check filter screen carefully for thin layer of fungus, especially if any traces of water show in either strainer or filter. Get out sand, rock chips, and look for signs of mud. Mud in this end may mean your fuel intake is blocked at the tank.



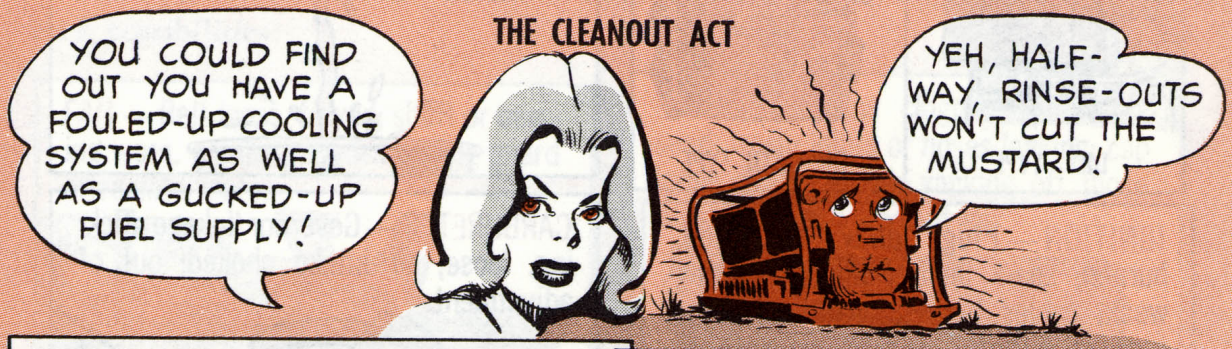
FUEL INJECTOR—Look for a cracked inlet collar, caused by over-torquing fuel supply line.

P.S MORE

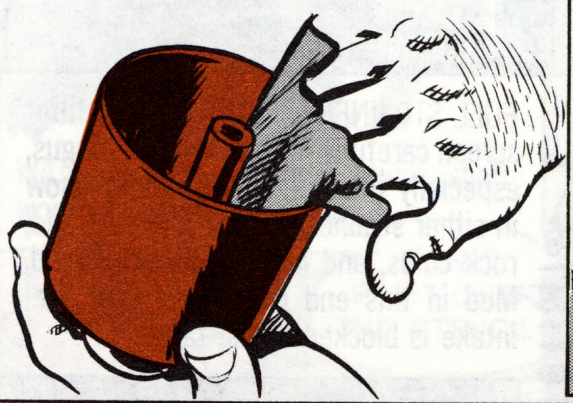
If you do find a cracked inlet collar on the fuel injector, more muscle on a wrench is not the answer. A temporary fix with plastic electrician's tape, teflon tape, or plain old black gasket cement will do for a time, but only on small cracks.



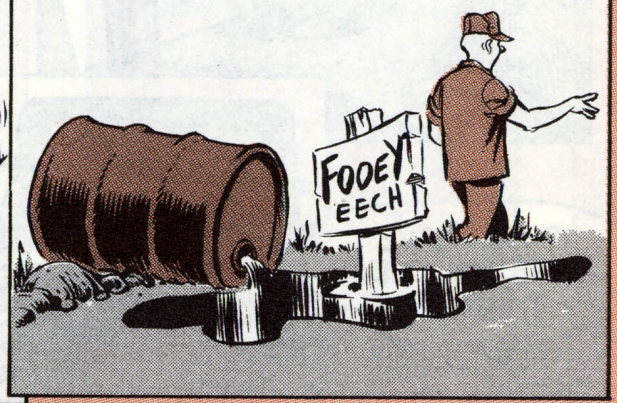
It could get you more trouble if you just check the strainer and not the filter . . . or vice versa. Strainers keep rocks and small fish out of fuel pumps. The filter catches fine stuff.



For filter cleaning, you hang out the No Smoking sign and wash out with any approved solvent—no carbon tet, gasoline, or other dangerous fluids. Clean-rag wipe the filter shell inside. Do the same with the strainer.



Next, eliminate the cause of the foul-up. Get rid of grit, mud and water in your fuel supply lines. Then you clean out your fuel tank. You may have to get rid of a whole 55-gal drumful—but don't grieve over it.

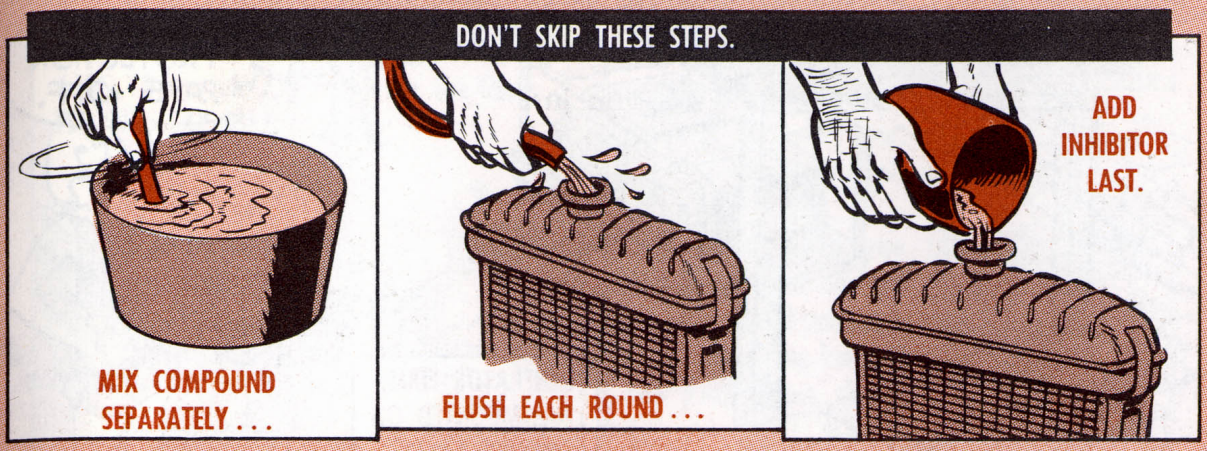


Radiator cleaning goes best with the kit from TB 750-651, FSN 6850-598-7328, Cleaning Compound, Engine Cooling System.

Drain your radiator and engine completely while hot. Completely dissolve chemicals separately before pouring in, unless package directions say **not** to. Check your mixing pail for sediment—don't put guck in a radiator you're trying to get guck out of. Be sure you protect your hands, eyes, and clothes from chemical burns.

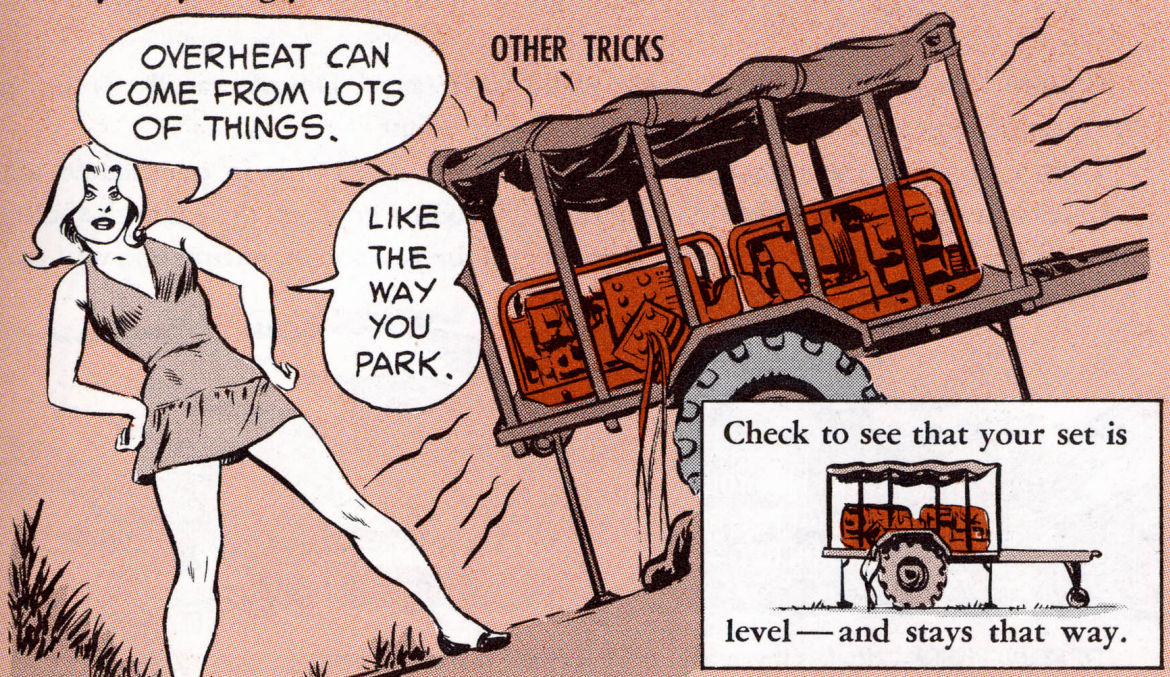
Flush after each round of chemical. Leave none of one chemical to mix with

the next. The second part of this kit, for instance, neutralizes the first part—and it could make a hunk of rock form in your radiator. Let no chemical-loaded water get onto anything it could hurt.



Check all hoses for leaks and soft spots, and replace weak sisters.

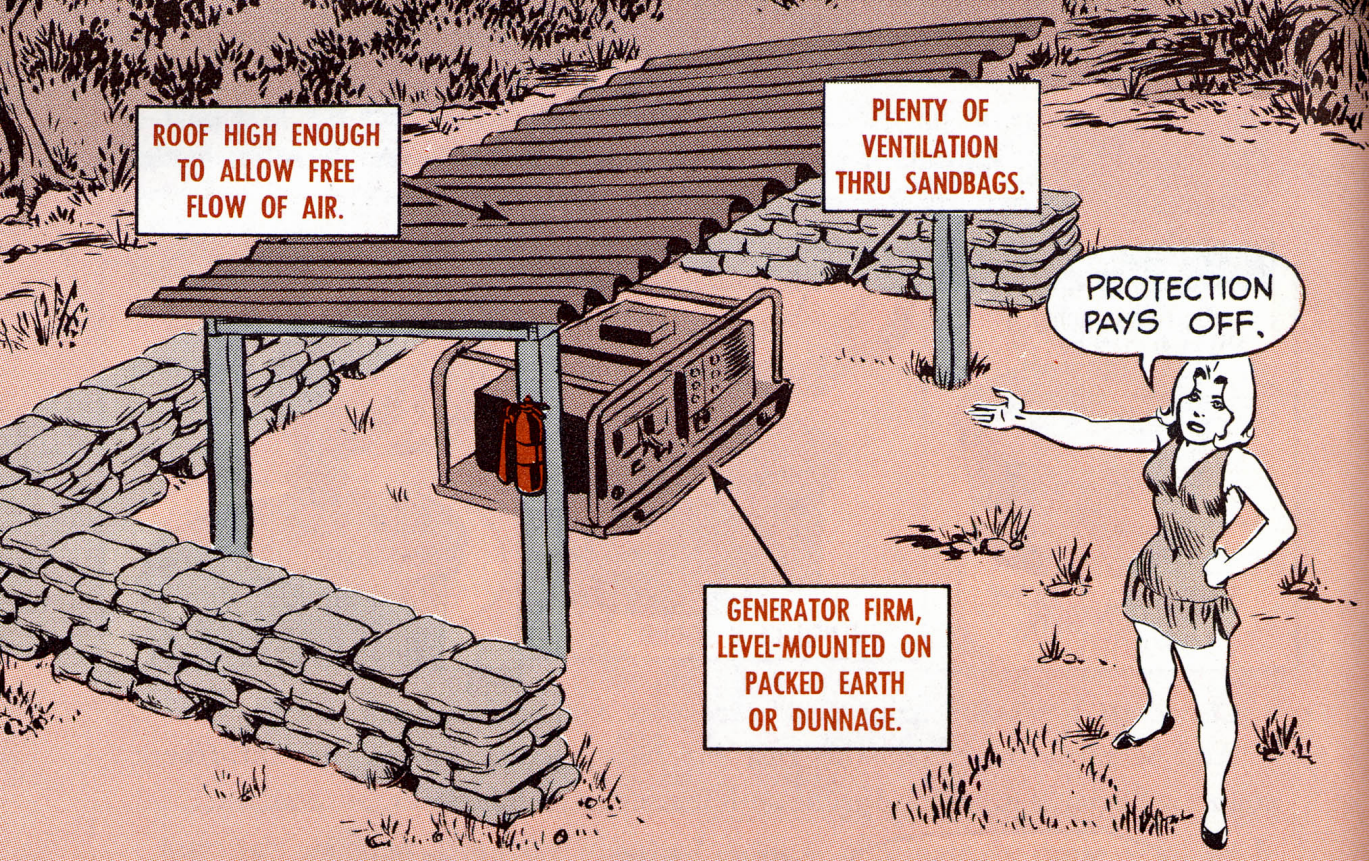
And be sure you put in the rust inhibitor unless you're in anti-freeze country. Ethylene glycol and arctic anti-freezes have inhibitors in them.



Over 15 degrees tilt knocks out your oil pump. Get a good foundation under your set. You may have to use dunnage and rock. On trailer-mount rigs, block up wheels and support legs. In dry season, get ready for rain.

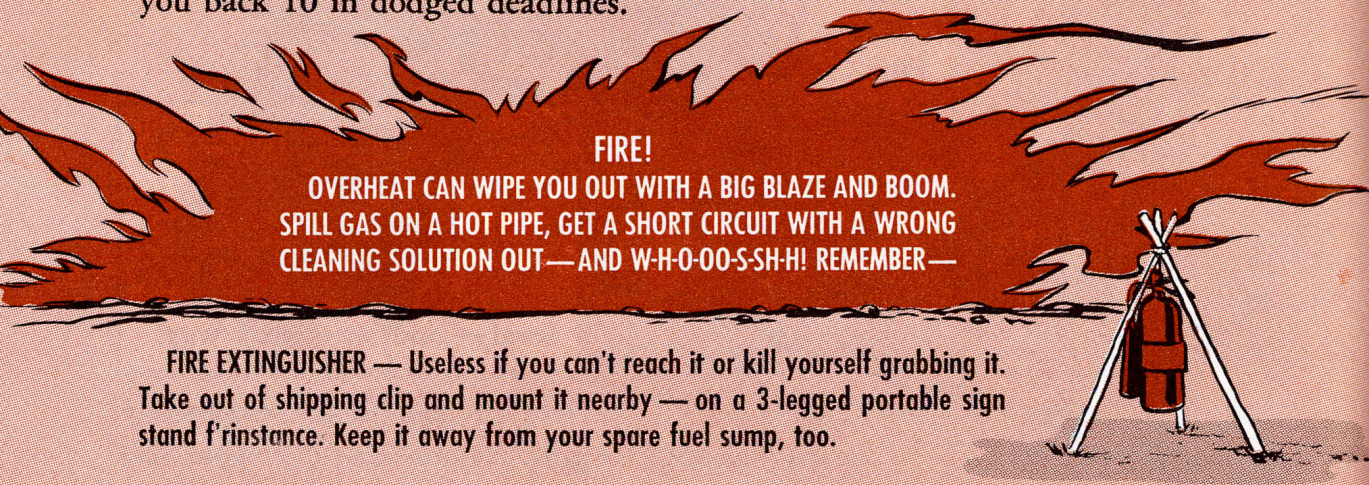
You can mount a level right on your set. FSN 5210-203-8056, Level, Bench (Fed Cat C-5210-IL-A, Jan 68), is fine. Check it regularly—even if you don't get a burn up from oil starvation, your set could slide in the mud . . . or skid downhill on sand . . . disaster.

P.S MORE



Besides that, your set has to have room to breathe. Double sandbags and a heavy roof may be great for mortar protection—but—

Closing a set in too tight keeps out cooling air and holds in overheated air. It takes lots more work to build a big enough, roomy enough, dry enough shelter that'll also keep out blowing grit. But every hour you spend getting one will pay you back 10 in dodged deadlines.

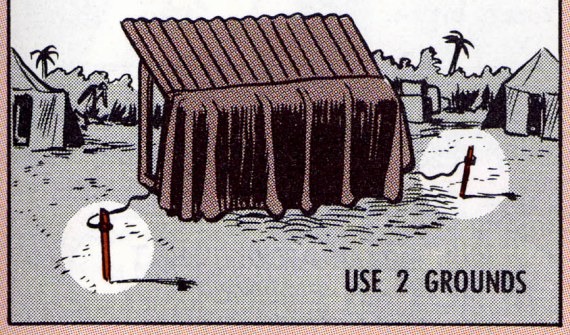


FIRE EXTINGUISHER — Useless if you can't reach it or kill yourself grabbing it. Take out of shipping clip and mount it nearby — on a 3-legged portable sign stand f'rinstance. Keep it away from your spare fuel sump, too.

Never touch a set that's running on fire. Insulation burns off fast. If you doped off and left your extinguisher on the rig, stand back and mourn the loss. Don't add your funeral to the bill.

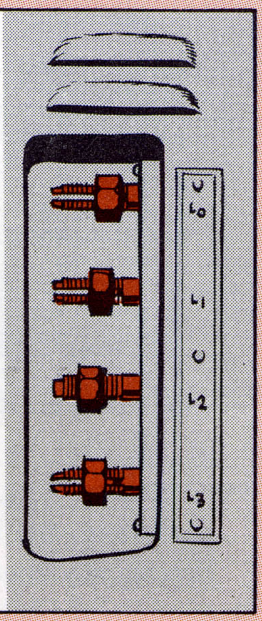
Heat in a generator shed can make you careless, too. You find yourself mopping off the sweat and wanting to get out. You hurry too much to check things you should, like—

GROUND ROD — Connections can come loose; ground can dry out around it; wire can break. In dry country, it's smart to have 2 ground rods like FSN 5975-642-8937, several feet apart. Wire, No. 6 AWG, FSN 6145-189-6695, 10 ft required, goes to each. Use Clamp, FSN 5925-243-5861, or equal.



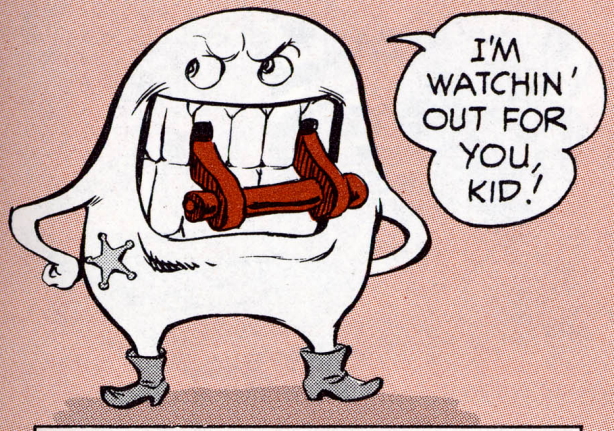
LOAD TERMINALS — Let no raw wire stick out over twice its own diameter. Must be clean of salt and dirt. Check only when set is dead and disconnected. Bindings must be tight, covers closed. Shorts spell calamity.

You can make one locked-cinch bet on that set of cards—if you don't check those fire hazards and quick killers, they'll get you.

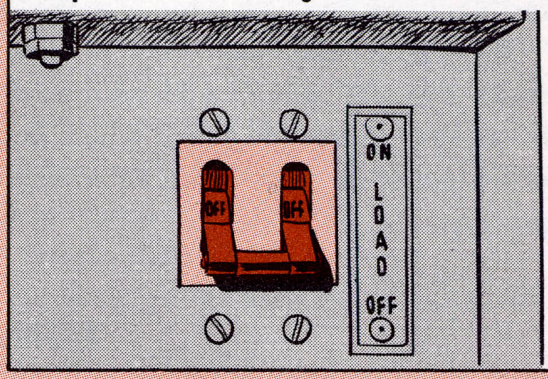


BOOBY-TRAP SCOUTS

You are in luck on one thing—you have a bunch of automatic scouts going for you in sets over 3 KW. They're built in to keep you from boobytrapping yourself—



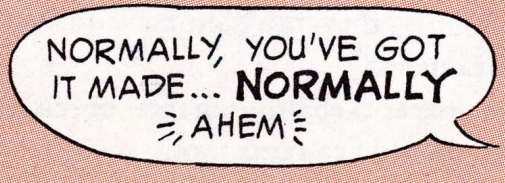
CIRCUIT BREAKER — Kicks off all outgoing power for overload protection. Overloads of 25 per cent or more bring a fast cut-off.

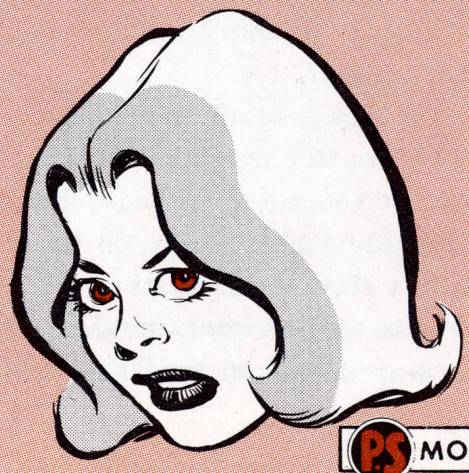


OIL PRESSURE SAFETY SWITCH — Cuts off engine if oil pressure drops under 18 PSI.

OIL TEMPERATURE SWITCH — Kills engine if oil temperature gets above boiling and near flash point (where oil would burn).

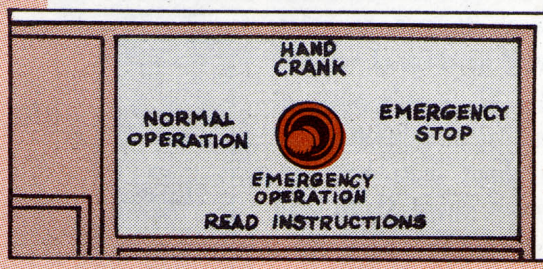
So, you say, nothin' to worry about.





P.S MORE

But there's another switch on your panel that knocks loose your oil safeties, and lets you run whether or no —



EMERGENCY RUN — Bypasses all your protection except Circuit Breaker. It's meant for use only when you have to go, in real emergency, or in a breakdown situation you just have to bypass.

The thing is, it'll let you run even when your cooling fins begin to glow red, your oil gets like soup, and your battery's dead . . . maybe not for long, but you **can** run.

But paste this in your hat:

Emergency means combat or major danger — not keeping the drink cooler in the squad tent down to 38° F.

Besides, even with those safeties, you could get major overheat damage. Safeties aren't 100 per cent certain, as many proud fathers know.

And naturally you'd never do it yourself, but there have been people who bypassed those sentry devices. Blocking off circuit breakers is one mistake —

Everybody needs more current sometimes. But play around with your built-ins and you risk having your whole unit down silent in the boondocks without power.

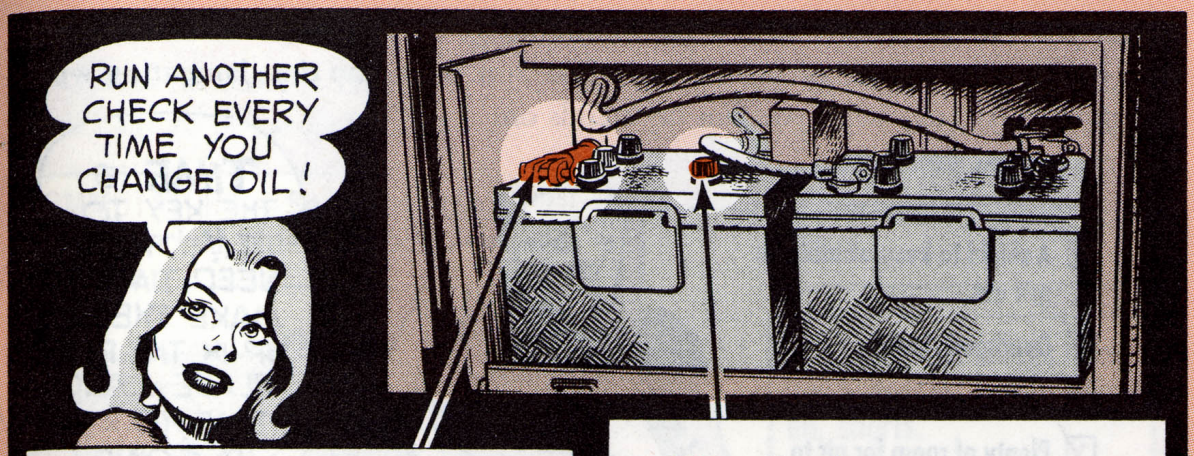
ANOTHER BOOBOO

Some folks think it's only cold weather that goofs up batteries. How wrong can you get?

Yet they goof off and let that current can conk. Then here's the picture:

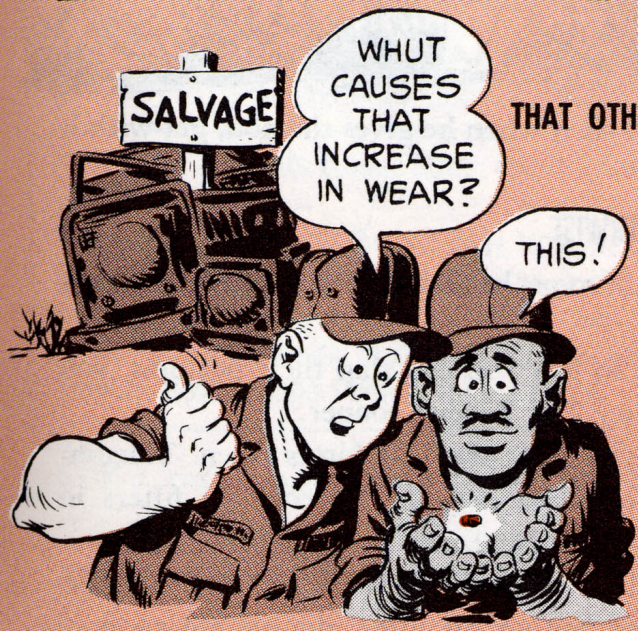
The starter won't work. That means rope-starting on Emergency Run. Then because the automatic cut-off switches won't work on less'n 18 volts and the alternator won't charge on less'n 18 volts, they can't go back to Normal. The battery stays dead unless it's changed out.

That spells either standing right there eyeballing gages or risking a fast burn-up on one more generator that shouldn'ta been shot.



CABLES — Clamps on battery posts must be clean and tight. Replace if frayed or insulation bad.

CELLS — Electrolyte must cover plate tops; use pure water to fill. Replace if case or covers break. Tropic hydrometer reading is between 1.200 and 1.225, 1.280 in cooler climates, on full charge. Keep clean.



THAT OTHER KILLER

Dirt does cause heat. But it's the worst kind of bad news on its own.

Let less than 1/200th of an ounce of dirt smaller than even 2-1000ths inch size in with a pint of your fuel, and you get an unlucky 13—the wear rate on your engine inside goes up 13 times. Let in 1/20th ounce, and you get 85 times normal wear. So is your Uncle going to buy you 85 times as many generators as you need?

Lots of outfits have tried lots of ways to beat dirt.

One plush set-up was a 45 KW in a half-dugout with room to run a D7E Cat Tractor all around it, all enclosed, and—

A 36-in fan set in a frame covered with screen wire, gauze mesh, and coarse curtain. Air zoomed in—minus sand and dirt.

Another big fan and overhead vents took hot air out; exhaust was piped off. An operator stayed handy. One breakdown in over a year.

So what does a dream deal like that take?

MAKE YOUR OWN

Enough work and some help can get you well off. Maybe you have just a 5 KW or 10 KW. Maybe you're no place close to a hill you can back up to.

P.S MORE

But you can get a start with a pile of sandbags shaped like a U and a sheet-iron roof to strain some of the fire out of the sun. Spend no time lamenting what you don't have; use what you can lay hands on.

Here's what you need:

Let your sergeant know the problem; then when he gives the nod, get with it and stay with it.

WEATHERWISE

A light sprinkle of logic on your handsome head will tell you certain jobs come oftener as weather changes.

When clouds so thick they gurgle are so low you can slap their bottoms, you know to check diesel fuel filters for water 2 or 3 times sooner.

When sand blows by like buckshot, you look after air filters often. Talcum-powder-fine dirt moving like a jet takeoff can clog up dry-core air filters in 2 hours or less. Oil-bath units won't go much further.

In dry season, even when it's not blowing much, you change oil oftener. Crankcase oil picks up grit. If your set has an oil filter, double up on core cleanouts then, too.

The thing is, don't wait until filters clog. Keep track of time, and get your licks in before your set starts gasping for oil or air.

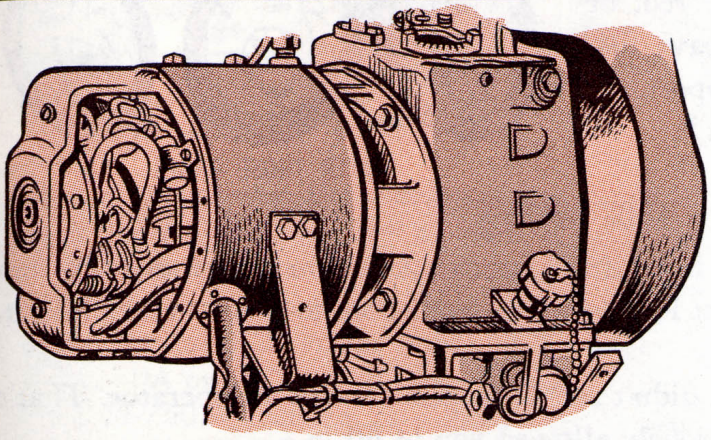
Otherwise, black smoke out of the exhaust could tell you it's getting late. That spells too little air, engine running weak, and carbon crusting inside.

ELECTRICAL END

Grit is no more a friend of your juice-producing box than of your engine. You have to be careful about—

COMMUTATORS — Segments ground down, trenched, pitted, sparking.

BRUSH FACES — Worn, overheating, pitted, chipped.



RELAYS — Bearings jamming, contact points burned, shorts.

ARMATURES — Insulation cuts, coatings rotted, output lowered, trickle-shorts built up.

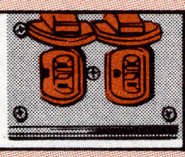
SWITCHES — Pivots ground down, contact points sticking or blocked, sputtering.

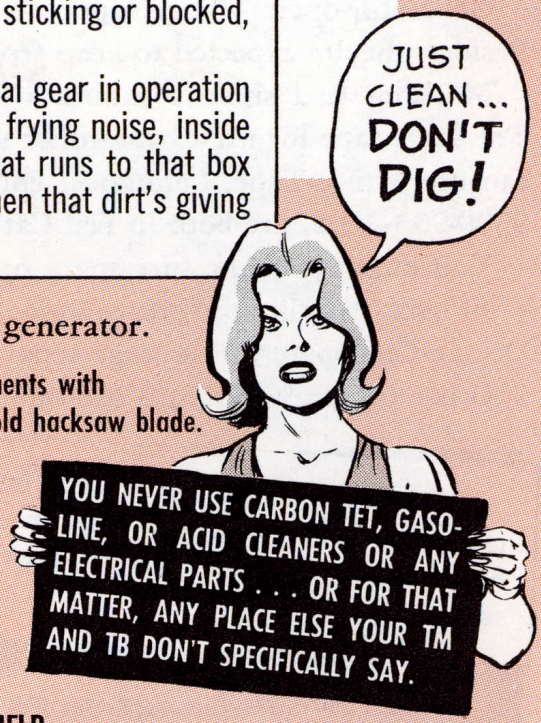
Keep your head and fingers away from electrical gear in operation — but sometimes you can hear a hiss, a sort of frying noise, inside relay or switch points. You may see a needle that runs to that box bounce a little or swing in jerks. It's a good bet then that dirt's giving trouble. Notify support before it gets worse.

You can be a favorite side-kick of your generator.

Cleaning — Smooth down grooved commutator segments with No. 00 sandpaper and clean the cracks gently with an old hacksaw blade.

OUTLETS — Load terminals and sockets must be clean, dry, and oil-free.





YOU CAN HELP

It's a bad mistake to put oil-soaked excelsior or gauze in front of the generator air vent inlet. That could get you spontaneous combustion — fire, that is. If you want to use window screen wire fastened down good, do, but keep it clean.

You can keep a running check by eyeing your instruments.

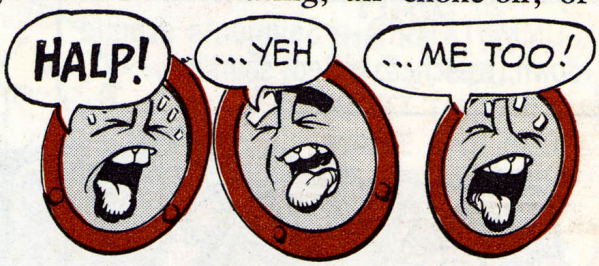
If you have a fairly heavy load, for instance, and the output ammeter begins to drop, you could have armature overheat.

P.S MORE

A voltmeter drop or surge can indicate trouble down the line or an unbalanced load. Look for somebody trying to use more juice than there is.

If you hear the engine throb and see your frequency meter jump, have a look at your governor. Then see whether you have overheating, air choke-off, or bad fuel.

And if oil pressure hits the skids, water temperature gets in the red, or your battery ammeter hits heavy discharge—shut down. Call support.



WATCH THOSE GAGES

LOOK AROUND

You can have the best site in Beautiful Southeast Asia, the best-tended set from Saigon to San Fran, and the best PM program from pole to pole—and blow it. The catch?

One attachment the factory didn't see fit to put on was an operator. That's why your generous Uncle graciously allowed you to fill in.

Generator operators are supposed to learn how to work and move in the dark. Besides, they're expected to keep from tripping up their own troop.

Marking fuel sump locations with reflective or luminous tape is one help. The same tape for fire extinguisher stands is good. Low-overhead roof supports can use it too. Tape, Luminous, FSN 9390-282-7867, or Tape, Reflective, FSN 9390-753-3208, are both in Fed Cat C9300-IL-A (Oct 68).

You ought to make sure spare fuel supplies of 10 five-gallon cans or bigger—or over 50 gallons in one container—get 15 feet from your juice jewel shop. Do sandbag spare fuel storage separately and do protect it from sun and rain.

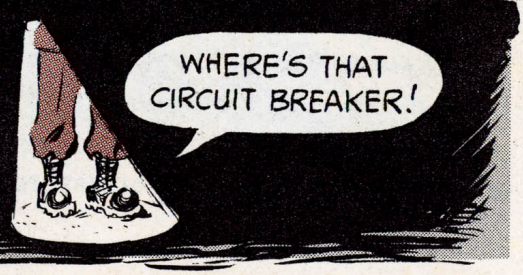
Other top-drawer tipoffs are on—

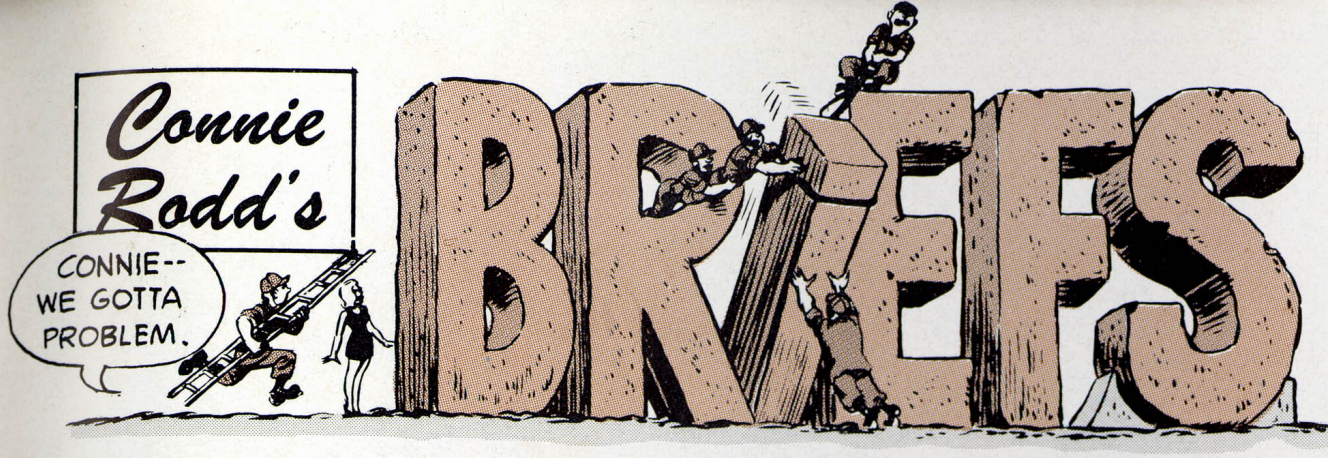
BURIED CABLES — Discarded iron pipe or plain I-beam makes good cover to keep somebody from sticking a spade into one. Mark such carefully.

LOCTITE COMPOUND — Keeps bolts from working out of stud holes or nuts on frames and panels (FSN 8030-952-2205 for 8 oz).

FUEL PUMPING — Filter-separator FSN 4330-051-0666 and water segregator FSN 4930-276-0087 are great.

CIRCUIT BREAKER — What, again? Yep, be sure it's **Off** when you fire up. 28-volt commo sets especially are guaranteed to burn out if you get to leaving the load switch on to start.





Top Level For All

From now on unit Materiel Readiness Reports (DA 2406) will list as "Authorized" reportable items (col. e) the **full** quantity of equipment called for under equipment level 1 in the unit's TOE, MTOE, TDA or MTDA. The next change to TM 38-750 will say so, as spelled out in DA Msg 901810 (20 Mar 69).

M728 CEV Oil Change

If your M728 combat engineer vehicle is in SEA or any other area where the temperature stays above 32°F, take the OE 10 out of your hydraulic reservoir and replace it with OE 30. USATACOM TWX 9-11, 616 (30 Sep 68) had the official word on this and the next change to LO 9-2350-222-12 is scheduled to say the same thing. The OE 30 will improve boom operation.

Pin On Your Tail?

Ruffled tail feathers on your UH-1 or AH-1G helicopter can put you in a spin if those castellated self-locking nuts in the crosshead are left behind. Make it a part of your Daily and Pre-Flight to see to it the cotter pins (MS24665-115) are holding the nuts so they can't get away.

Sheridan Correction

PS slipped up on that stab mode item on page 42 of PS Issue 198. It was half right, half wrong. It is OK to fire a conventional round in stab mode while on the move. You never fire the missile in the stab mode. Firing conventional rounds on the move with the stab mode is being done in Vietnam. It works real well with the canister round and on all area targets.

Hold That Order

Hold one and don't order that radio decal from Sacramento like the article on Page 48 of PS Issue 198 said. There's been some rethinking, and that decal is going to get an FSN. Watch PS for later news on the decal and its FSN; meanwhile, send no money to Sacramento.

Tallying Your TK-101?

Commo repairmen who need the latest listing, the pictures, of the components in the TK-101/G tool set should keep an eye peeled for a new catalog, SC 5180-91-CL-R13. Your pubs people should be able to get it quick-like.

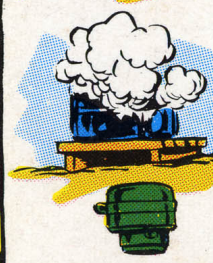
Would You Stake Your Life right now on the Condition of Your Equipment?

DON'T GOP OUT ON ELECTRICAL GENERATORS

STAY PLUGGED IN

KEEP THEM LEVEL

KEEP CRANKCASE OIL UP



WARM UP BEFORE SWITCHING LOAD

DON'T OVER-LOAD CIRCUIT

KEEP AIR FILTER CLEAN

PROTECT IT AGAINST WEATHER

KEEP WELL VENTILATED